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The Automobile Magazine ILLUSTRATED



VOL. II

JUNE 1900

No. 3

The United States Industrial Publishing Company
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Night Scene
Returning from "Old Paris"
(Exposition 1900)

The Automobile MAGAZINE

VOL. II

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No. 3

At the Exposition of 1900

PARIS, May 15—The International Universal Exposition of 1900, announced by a decree of July 13, 1892, and decided by a law of June 13, 1896, was inaugurated by the President of the French Republic on Saturday, April 14.

"The opening," says *L'Officiel*, "thus took place at the date originally fixed. In preserving this date, despite the delay that circumstances beyond control caused in the different parts of the Exposition, the government of the Republic knew that it was able to rely upon the absolute devotion of all those who were associated in the vast enterprise."

The imminence of the opening had, for a fortnight, been exciting the energies of every one to the utmost, and foremen as well as laborers ungrudgingly furnished the powerful effort that the country expected from them. Owing to such effort, the state of completion of the enterprise in all of its principal parts is such that *but a few days will suffice to finish the particular installations.*"

L'Officiel itself admits that "an Exposition has been inaugurated, but an exposition in which *working as yet is exhibited!*" This is doubtless by tradition, since precisely the same was the case in 1889. The last Exposition was opened on May 6, although the work was not far advanced, since it was not till June 15, that is to say, about five weeks after the official inauguration, that the completion of the installations was celebrated.

Class 30, that which interests us more particularly, *will be installed on the Champ-de-Mars, in the Palace of Engineering and Transportation, situated on the Avenue de Saffrenside.*

A series of bas-reliefs upon the façade of this palace narrates the history of all the methods of transportation and locomotion

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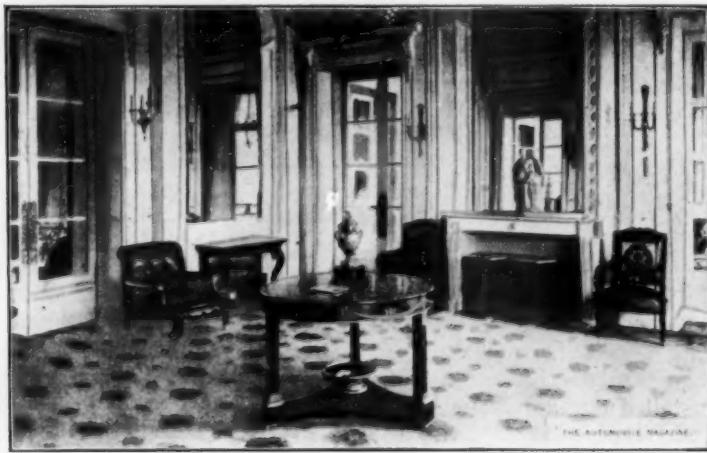
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Automobile Club of France

devised by human industry. From the primitive voyages on foot and horseback to those more modern ones for which we utilize the railway, the bicycle, the automobile and the balloon, all are represented in remarkable sculptural forms worthy of attracting the attention of visitors.

It was befitting that such history should be thus glorified; for is not our *fin de siècle* the epoch of marvellous and radical transformations in every method of moving about?

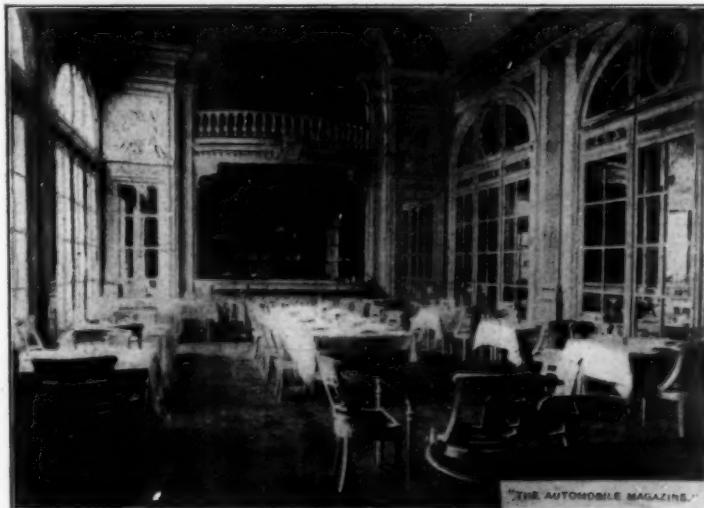


A Salon, Automobile Club of France

At the Exposition of 1900

The hippomobile hack No. 1 of the Compagnie Générale des Voitures, and a few packing cases that must doubtless conceal something (but what?), alone represent to our eyes the most modern instruments of locomotion and transportation.

At the Vincennes annex it is worse still. This has been opened to the public, it is true, but only that the pledge given by M. Bouvard to the Municipal Council might be kept. Nothing is finished here, and even the entrance cottages have not been constructed. Nevertheless, visitors may see something like a hundred cars and locomotives of all systems on exhibit in the



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Dining Room, Automobile Club of France

railway section, the most important one of the Vincennes annex. This section occupies the vast quadrilateral comprised between the fortifications, Avenue de Graville, the circular road, and Charenton. A branch starting from the Vincennes line, between the Bel-Air and Saint-Mandé stations, enters it at the Reuilly gate. Here stands the semaphore, a switching post from which are controlled the twenty-two tracks that give access to the immense halls in which are exhibited the rolling stock of France and of foreign powers.

These halls, which are constructed of iron, have trusses of 46 feet span, spaced 32.8 feet apart. They are five in number

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Billiard Room, Automobile Club of France

and have the successive lengths of 656, 623, 590.4, 557.5 and 524.8 feet. Their height is 49.25 feet. They are covered with glass and are consequently perfectly lighted. They are to be occupied in the same order by the following powers: France,



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The Roof Garden, Automobile Club of France

At the Exposition of 1900

Russia, America, England, Belgium, Austria-Hungary, Germany and Italy, each of which will have four tracks at its disposal.

There are other halls set apart for the sections of aerostation, cycling and automobilism; but there is nothing material to be seen, and very little animation seems to prevail.

Optimists calculate that it will require six weeks longer to get things ready, and it is thought that it will be possible for the official inauguration to take place on the 24th of May—Ascension Day. For that day a fête at the park of Aerostation would suggest itself!

The work of arranging things at the Champ-de-Mars, although not so far behindhand as that at Vincennes, will require a few weeks more before it is entirely finished.

Class 30 will certainly not have its full complement of exhibits before June 10. Those whom this part of the Exposition particularly interests, that is to say, all our readers, will do well, if they wish to derive a general and complete idea from their visit, to postpone their trip, in case they have purposed making one previous to that date.

The Military Automobile at the Exposition of 1900

THE Committee of Class 116, armament and artillery material, of Group XVIII. of the Armies of the Land and Sea, decided upon the plan (now realized) of selecting from among the vehicles necessary for the requirements of the army various types that seemed as if they ought to lend themselves more particularly to automobile applications, and of entrusting the construction of such models to a certain number of manufacturers.

The collective exhibit, thus constituted, will comprise 12 vehicles, 2 of which are driven by steam, 1 by heavy petroleum and 9 by gasoline, viz.: a traction engine for the service of the artillery, engineer corps, commissariat, etc.; a truck designed for the same purpose; a paymaster's wagon; a medical carriage with surgical apparatus, medicines, etc., and a dismountable tent for visits and operations; a traveling telegraph office provided with Morse apparatus; a telegraphic van; a carriage for army postal service; an omnibus for the carriage of personnel; a carriage for the Commander in Chief of the Army, or the Commander of an army corps; a high-speed automobile for the service of the staff-

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office of the army; a voiturette for the service of staff officers, and a moto-cycle for the transmission of orders.

These apparatus were distributed among the following manufacturers: Société Scotte, De Dion-Bouton & Co., Société Morse, De Dietrich & Co., Société Koch, Sauter, Harté & Co., Société Georges Richard, Société Panhard & Levassor, Société Peugeot, Société Decauville, Kellner & Fils, and Rheims, Aucher & Co.

The majority of these automobiles will be of the uniform slate-gray color adopted for the rolling stock of the army. All will carry inscriptions or devices indicating the purpose for which they are designed.

The space reserved for them is located in the Palace of the Armies of the Land and Sea skirting the Quai d'Orsay, and on the upper ground floor, that is to say, on a level with the roadway of the quai.

It comprises two stands (No. 48) placed near the central vestibule of the palace, opposite the new foot-bridge, one extremity of which rests upon Quai Debilly.

This exhibit constitutes a great advance to the front for the automobile cause, and such dedication of the new mode of locomotion does the greatest honor to the Committee of Class 16, from which the manufacturers have received nothing but aid and encouragement, and also to the organizers of and participants in the exhibition of military automobiles.

The exhibit under consideration will certainly be one of those most visited by specialists, who will find here, not a number of vehicles more or less adapted, in haste, to a special use, but rather a number of models that have been elaborated with very particular care.

Automobile Conveyance in the Interior of the Exposition

In order to go quickly and without fatigue from the galleries of the Champ de Mars to the palaces of the Quai d'Orsay or the installations of the Esplanade des Invalides, a person has the choice of two methods of conveyance—the rolling platform and the electric railway. Both follow the same route, and each forms a long endless belt that circumscribes the space comprised between Avenue de Labourdonnais, the Quai d'Orsay, the Esplanade and Avenue de la Motte-Piquet, for a total length of about 11,150 feet, say a little over two miles.

At the Exposition of 1900

In passing over this perimeter, the electric trains always run in a direction from right to left, so that in taking a train, say at Porte Rapp, the passenger reaches the Quai d'Orsay and then the Invalides and returns via the Military School to the starting point. The platform, on the contrary, rolls in the opposite direction; and, moreover, is established for its entire length at the level of the first story of the exhibition galleries of the Champ de Mars and of the Esplanade, with the floor of which it directly communicates, while the electric railway, which sometimes runs close to the ground, rises or descends, according to circumstances, after the manner of a gravity railway, in order to cross, by viaduct or tunnel, the public roads that it meets.



Automobile Sidewalk

The rolling platform, which was devised by MM. Blot, Guyenet and de Mocomble, consists essentially of three footways, one of which is stationary, while the two others roll continuously, one at a speed of 2.63 miles an hour and the other at that of 5.27 miles. The passengers ascend to the platform on the side at which the stationary footway is situated and pass with the greatest ease from the latter to the low-speed footway, and thence to the high-speed one, where they are free to stand or to further increase their speed by walking thereon in the same direction in which it is moving.

In order to leave the platform, the same operations are performed in a contrary direction. The object of the intermediate footway is, in both cases, merely to assure the passengers' equi-

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librium, which would be endangered by too abrupt a passage from a state of rest to a high speed, or inversely. Posts placed

at regular intervals further facilitate the passage from one footway to the other.

The high-speed footway is $6\frac{1}{2}$ feet in width, the low-speed one, on which the passengers do not tarry, is 3 feet, and the stationary part of the platform is $3\frac{1}{2}$.

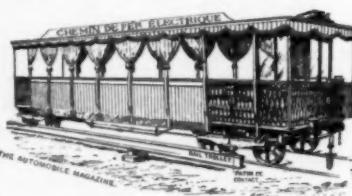
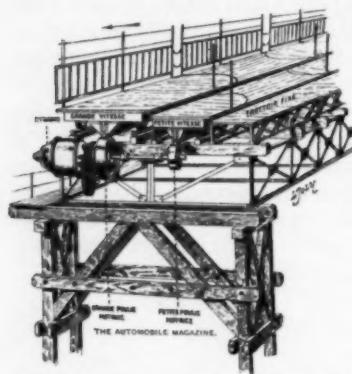
The movable footways consist of a succession of four-wheeled trucks connected with each other by trucks without wheels. The first run upon lateral rails, while the others serve to assure the continuity

Mechanism of the Rolling Platform

of the system. The extremities rounded in a contrary direction so as to fit into each other and follow the curves of the track.

Motion is communicated to the footpaths in the following manner: Under each truck is fixed a sort of rail or "axial beam," which is jointed at each extremity to those of the adjacent trucks. These beams slide over driving pulleys, placed here and there, which transmit the motion that they receive from the dynamo-electric machines with which they are connected. The variation in speed between the two movable footways is obtained very simply by the difference in diameter of their driving pulleys, which, as may be seen in one of our figures, are mounted upon the same axle. This diameter varies from simple to double, and the velocities vary in the same way.

Some very ingenious arrangements for the regulation of the suspension springs of the wheels, for their easy inspection, and even for the changing of them while the apparatus is in operation, have been elaborated by M. de Moncomble. The entire system is elevated upon a metallic viaduct supported by wooden trestles in order to diminish noise and deaden vibrations.

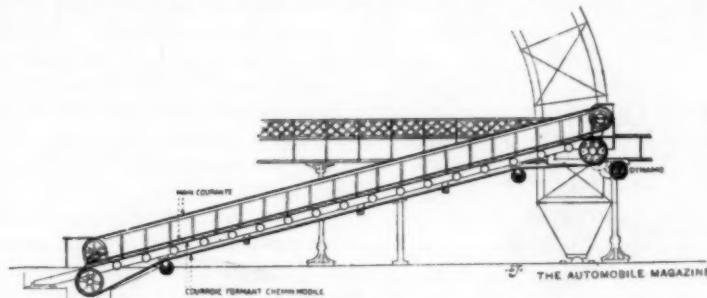


Automobile Car of the Electric Railway

At the Exposition of 1900

The electric energy necessary for the running of the platform, as well as that of the railway, is to be furnished by the works that the Compagnie de l'Ouest has established at Moulineaux for the service of the line between the Invalides and Versailles. The current is received in a special electric station erected on the Champ de Mars, not far from the Quai d'Orsay, where it is transformed and raised to the required voltage, in order to be afterwards distributed, through conducting cables, to the dynamos of the platform and the "trolley rail" of the railway.

The platform is reached through stairways and, at certain places, through movable ramps, while direct communication with the first story of the palaces is obtained by means of footbridges and passageways. These approaches are established at points that are called "stations," and perhaps improperly so, since, as



A Movable Ramp

the movable pathways have a continuous motion imparted to them, they do not admit of stoppages; and, moreover, passengers can get on or off the platform at any point whatever of the route. These "stations," which are formed through a simple widening of the stationary pathway and are covered with a glass roof, are eleven in number, namely: Rue Saint-Dominique, Rue de l'Université, Pont des Invalides, Palais de la Perse, Puissances Etrangères, Palais de l'Hygiène, Pont de l'Alma, Palais des Armées de Terre et de Mar, Tour Eiffel, Porte Rapp and Palais de l'Agriculture.

The fare will be half a franc (10 cents) for any distance less than that embraced in the round trip, which will consume twenty minutes. There is no doubt that this new method of conveyance will be widely patronized by the visitors to the Exposition.

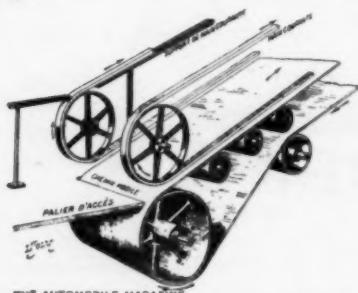
The feature of originality of the electric railway is the application of a system of transmission of electric energy by means

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of an insulated third rail placed externally to the two rails that constitute the track. This is, in a manner, a "trolley rail," which transmits the current to the cars through the intermedium of pivoted contact—slides, as shown in one of our figures. The service is effected by trains composed of three cars capable of carrying about two hundred persons, and succeeding each other at intervals of two minutes.

The first car of each train is automobile, and is provided with four 35 horse-power motors that permit it to make a round trip in twelve minutes, inclusive of stoppages.

The cars are of the open type, like those used in certain cities in summer; but the precaution has been taken to close them tightly on the side on which the conducting rail is situated, so as to prevent any accident due to the imprudence of the passengers, who are therefore obliged to get in and out on the opposite side.



Entrance of the Movable Ramp

already used in several large stores in Paris, and that will permit the visitors to avoid the fatigue of climbing stairs in order to reach the various stories of the palaces.

These ramps are of various models. The one that we represent herewith is of the Piat system. There are ten of this type at the Champ de Mars and seven at the Invalides. They present a great analogy with those employed in the Magasins du Louvre.

What further renders such arrangements very interesting in places where there is a large crowd is the fact that their capacity is much greater than that of elevators or even of ordinary stairways. With a ramp of this type, the ascensional speed is from 20 to 22 inches per second. In other words, it takes from 30 to 35 seconds to ascend to a height of about twenty feet. As the ramp is capable of accommodating from 30 to 35 persons at once, its total carrying capacity is from 3,000 to 4,000 passengers

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an hour. An elevator of ordinary dimensions is capable of carrying but from 300 to 400 persons in the same space of time.

As for mechanism, the movable ramp consists simply of a very thick and strong endless leather belt, tightly stretched, and supported by a large number of rollers in the part designed for the passage of the public. Two other endless belts form side-guards, which likewise are movable. In other systems the leather belt is replaced by a movable platform of jointed flat rods, recalling the method of closing photographic frames.

Parisian Fashions for the Automobile

DAME FASHION, ever watchful for the interests of her votaries, has decided what is the correct toilette for the *chauffeuse*. What Parisian *modistes* offer their patronesses is shown in the accompanying illustrations.

One of our engravings represents an automobile costume made of soft, black leather, the dull sheen of which is exceedingly effective. The coat, lined throughout with silk, harmonizes excellently with the loose paletot ornamented only with a narrow border of trimming. The high, turned-down collar is covered with velvet. Although waists of any desired character can be worn with this suit, a *crème* flannel waist seems most appropriate. The cap (*casquette*), in its overhanging portion, is made of woven horse-hair and is finished with a narrow strip of velvet around the edge. The peak is made of patent leather. Glasses can be used to protect the sensitive eyes of the automobiliste from the dust of the road and from the biting air.

The second toilette which we illustrate consists of a rather long, smooth coat made of dark-brown material, a silk waist of like color, and a *redingote* of leather, lined with silk, the borders being fastened by large buttons to a *paletot* provided with two capes and *revers*. Feathers and a few rosettes are used to trim the hat.

There are many members of the Automobile Club of America now in Paris, and others constantly arriving, and the reception accorded those who have registered at the Automobile Club of France has been of a most cordial character. The list of the visiting American automobilists includes Mr. John H. Flagler, Mr. Jefferson Seligman, Mr. C. J. Dinsmore, Mr. Louis Stern, Mr. Alexander Winton, Mr. Roland R. Conklin, Mr. Charles S. Weston, Mr. D. E. Stone, Mr. C. J. Field and Mr. Albert C. Bost-

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wick. It is to one of these gentlemen that we are indebted for the various photographs of the home of the Automobile Club of France, together with some excellent suggestions relative to the prospective establishment of a club-house for the Automobile Club of America.

Society Women as Motorists

By William Earle Baldwin

AUTOMOBILISM in society is not confined altogether to the men. A dozen or more women well known in the most exclusive circles of New York society have fallen victims to the fascinating art of driving an automobile, and before the summer is over as many more will join the ranks of motorists. All of these women do not operate their motor carriages in town, but several of them have become so skillful that they do not hesitate to go out on Fifth avenue or any other crowded thoroughfare, and take their chances with the best of them. Most of the women motorists, however, have confined their adventures to the country, and have had all sorts of interesting experiences, particularly at Newport, where the automobile parade, and its subsequent incidents, was the hit of the season.

The automobile has also been taken up seriously by society for more formal use, and the old-fashioned victoria or brougham drawn by its high-stepping horses is being put aside, to some extent, for the automobile brougham and the handsome type of carriage known as the victoria daumont which have made their appearance on Fifth avenue of late very frequently. Indeed, one prominent family in New York has given up its private stable altogether, and, instead, has installed a complete automobile outfit, including carriages for every conceivable occasion. The result has been very satisfactory, and by next winter many others will follow the example of these pioneers in Twentieth Century development in transportation.

There is no smarter appearing horseless vehicle than this victoria, and with the two men at the rear in immaculate livery, the effect of exclusive privacy is given to great advantage. Several society women in New York use these handsome vehicles for the purpose of paying afternoon calls and attending teas and receptions, and it is needless to say that they are envied by their less fortunate friends who have to be contented to go about in the old-fashioned carriages, drawn by horses.

One of these Victorias is owned by Mrs. Henry B. Hollins, who is seen out every pleasant afternoon on Fifth avenue. She appears to enjoy her trips about town very much, and the men at the rear who guide the machine are dressed in the livery of

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the servants of the Hollins family. Another of these victorias is owned by Mr. Jefferson Seligman, and members of his family use it constantly. Mr. E. B. Pennington is another gentleman who has recently added a vehicle of this description to his equipment of automobiles. These victorias are finished much like an ordinary carriage of this description, and combine lightness with speed, as well as smartness and style. They are making a great hit, and before very long society people will travel about town to fulfill the various engagements incident to the society season in them, or vehicles of similar design.

One of the first young women to operate an automobile about the city streets was Miss Florence E. Woods, the daughter of Mr. Clinton E. Woods. She showed such skill in the art of using a horseless carriage, that she was granted a permit to take her machine into Central Park, and is to be seen there nearly every pleasant day. It is said that Miss Woods always had a tendency towards mechanics and similar matters, and she learned to operate an automobile in fifteen minutes. If this is so, Miss Woods certainly breaks records, as some of the men automobilists have not proven themselves so clever. Indeed, cases have been known where men have practiced day after day, and have ended by running down fences, innocent dogs in the highways, or colliding with trees, to the great disadvantage of the tree, not to mention the automobile.

It is interesting to note, in relation to Miss Woods, that she has always been afraid of horses, and has never driven one in her life; but she took to automobilism as a duck does to water. She is an attractive girl of medium height, with gray eyes and brown hair. She has operated all kinds of automobiles, from a heavy Stanhope phaeton to the lightest sort of a runabout, and can do all sorts of fancy tricks in turning, stopping, starting and all the many different things which an expert motorist should know.

A society woman of much prominence in New York, who has lately taken up automobilism, is Mrs. Rhoades, who has a magnificent house at the corner of Fifth avenue and Seventy-second street. As far as is known, Mrs. Rhoades is the first woman to undertake the management and operation of a gasoline carriage. Not long ago she became much interested in automobilism, and in spite of the many different things one has to know to properly operate a carriage of this description, she had no hesitation in securing one, and recently she has had it out on the street, and so far has not had a single accident. Mrs. Rhoades has a decided taste for mechanics, and before she secured her carriage she investigated the interior arrangements of the

Society Women as Motorists

vehicles, so now she can do all the little things required, such as filling up the gasoline tanks, whirling the heavy crank to start the thing going, and then taking care of the machine after it gets well under way. Mrs. Rhoades recently did a little riding around Atlantic City in her automobile, and simply astonished the dwellers in that usually quiet resort by the handy way in which she managed her automobile when out for a little spin.

Mrs. Hermann Oelrichs has taken up the Victoria of a small pattern for driving about town, and also has a runabout which she occasionally operates. Since the automobile parade at Newport last summer, Mrs. Oelrichs has been taking lessons in automobilism, and will astonish some of her society friends when the right time comes.

Mrs. A. L. Riker, wife of the winner of the recent fifty-mile road-race on Long Island, is becoming an expert automobilist, and frequently is out in a pretty runabout.

Mrs. John Jacob Astor, one of the most beautiful women in society, became much interested in automobilism last summer, and Mr. Astor provided a special carriage for her own use while at Newport. She became so interested in the sport that she intended to use one in town during the past winter, but finally gave up the idea. Mrs. Astor's favorite carriage is a Stanhope phaeton.

The first woman automobilist in the society set was Miss Daisy Post, a niece of Mrs. Frederick Vanderbilt. She took up automobilism some two years ago, and her first carriage was a big Stanhope, which she learned to guide with great skill. She has done little work of this sort in town, but for the past two seasons at Newport, she was a prominent figure, and all of the visitors there soon became accustomed to seeing her driving her auto about the city at what appeared to them to be a most reckless speed. She never had any serious accidents, however, and was so much admired by the men for her dashing courage, that many other women of the Newport set found that in order to be thought sporty they must follow her example.

Then Mrs. William K. Vanderbilt, Jr., took to automobilism, and she had better success than did her liege lord, who owned an acrobatic auto, which turned handsprings while going down hill. Mrs. Hermann Oelrichs and Mrs. Charles Oelrichs at once sent for automobiles, and soon the entire Newport colony was automobile crazy.

Mrs. Stuyvesant Fish, who now is looked upon as the leader of the most exclusive set in society, barring Mrs. William Astor, is an expert automobilist. To see Mrs. Fish sitting back in her

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victoria, being whirled down the avenue, after two horses the equal of any of the finest horses in town, one would not think that she cared anything for automobiles. She does not even turn her head to glance languidly at the various public autocarriages, even if the drivers nearly collide with her handsome trap. But as soon as she gets to the country all of this is changed, and the first thing she orders after breakfast on the first day of her visit is her automobile. Mrs. Fish learned to drive an automobile last summer at Newport, to the great detriment of the lawns about her fine place there. She didn't mind stone walls, big trees and shrubbery, and finally ran the machine up the wide stone steps of her villa. This experience did not curb her desire to drive an auto, and now there are none more expert than she. At Newport this summer, where Mrs. Fish will entertain largely, she will have a supply of automobiles on hand for the use of her guests, among whom, by the way, are to be Mr. and Mrs. George J. Gould. Another visitor at the Fishes will be Miss Greta Pomeroy, a mighty huntress, who has shot bears and buffalo, and who is now mastering the difficulties of running an automobile. She witnessed Mrs. Fish's trying experience, and not warned by the awful example, resolutely set to work to become an automobilist herself. It is understood that one of the features of the Newport season will be automobile races between these two fashionable women.

Mrs. Harry Payne Whitney, formerly Miss Gertrude Vanderbilt, is another young woman who is enthusiastic about automobilism, and as a motorist she hopes to make an excellent record during the coming summer. She rode about Newport a great deal last season in the comfortable victoria which was so popular there, and seemed quite contented; but now so many women are taking up automobilism, she has determined to get in the swim. While at her husband's place on Long Island recently, Mrs. Whitney did some practicing, and she will enter the ranks of the women motorists well equipped with the necessary experience to show them a thing or two. Mrs. John R. Drexel is another society woman who is fond of the electric victoria, and she has decided to stick to it, and not try to operate a machine herself.

Mrs. Oliver H. P. Belmont was one of the leaders in automobile matters last season at Newport, and took a prominent part in the parade, having one of the most strikingly decorated vehicles in the line. Her plans for the coming summer indicate that she will be out more than ever, and if there is an obstacle race she will stand an excellent chance for the first prize, as she

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is getting to be something of an expert. Mrs. Belmont is one of the handsomest women in the Newport set, and has lost none of the beauty which made her prominent for many years in New York society.

Mrs. Adolf Ladenburg, whose tastes have usually run to horseback riding, and following the hounds at the meets of the Meadow Brook Club, has fallen a victim to the fascinations of automobilism abroad, and her friends here expect that when she returns she will bring two or three horseless carriages with her. It is only recently that she has taken up automobilism, and if she goes in for the sport as thoroughly as she has for horseback riding, it will take a very clever person to beat her in an obstacle race or anything else.

In addition to the fact that automobilism is good sport, the society women appear to like it, as it permits them to wear very novel and handsome gowns, most of which they secure in Paris. There are styles in automobile costumes just as there are in everything else, and if a woman can add another style of gown to her wardrobe that is different from everything else she is perfectly happy. One great feature of the automobile parade last season was the handsome gowns worn by the women. Those who drove their own machines were attired in the conventional automobile dresses, while others who went as guests of the various society men who took part wore pretty gowns such as might be seen on the occasion of the New York Coaching Parade.

Newport will be the great headquarters of the women motorists this season, and the arrangements for the parade will soon be made. It promises to be the great out-of-door event of the summer, and there will be a big array of the vehicles in line. None of the Lenox set have taken up automobilism to any great extent, with the exception of several men, but if Mrs. Harry Payne Whitney visits the Berkshires this summer, it is her intention to try the hilly roads in that section, in company with her husband. Up the Hudson a number of women will be out, including Mrs. Rhoades, who has a fine country place in the vicinity of Tarrytown.

The tendency of the present age is to allow women much more latitude in the selection of their recreations and amusements than formerly. They have come to the front in out-of-door sports very rapidly during the past few years. In golf, some of them have had great success. In automobilism it is predicted that their keen eyes, quick and ready hands, and steady nerves will all contribute to making them successful as motorists.

Doings of the Automobile Club of America

THE active season of the Automobile Club of America has just set in, and though many of its most energetic members have departed for Europe in anticipation of the automobile races in Paris, the summer season will be replete with attractive incident.



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M. Léonce Blanchet, of the Automobile Club of France

Among the most important of these undoubtedly will be the run to Philadelphia, June 2, for which the members of the Com-

Doings of the Automobile Club of America

mittee on Runs and Tours are making great preparation. This will be the first long-distance run held by the Club, its purpose being to test the endurance of the machines participating rather than an exhibition of speed.

Another notable event of the coming season will be the forthcoming series of automobile trials and tests which are to take place this month. Following is a letter, addressed to the Club's members, embodying the purpose of the idea:

Acting under the direction of the Board of Governors, the Technical Committee is preparing the details for a series of trials and competitive tests, which are intended to develop the strong features in turning, stopping, avoidance of obstacles, hill climbing, and other various manœuvres, which will develop the strong points of each one of the different types of automobiles, and also comparative ones in competition with horse-drawn vehicles, the idea being to make this an interesting and instructive series of tests for the benefit of the club members and the public at large, and also to develop the question of safe speeds for the different types of automobiles.

The Chairman of the Technical Committee asks as a special favor that all the members of the club give their thought to this matter, and any ideas which they have on the matter to kindly forward to him about the middle of June.

This is about the time Mr. Field will return from his trip abroad, and the committee proposes to take the matter up at that time to formulate rules and regulations in the matter, and issue them for the information of the club members during the month of July.

It is proposed to hold these tests at some place in New York City during the early fall.

Your hearty co-operation in the matter in making suggestions and also arranging to take part in them will materially aid in making these trials what we believe they should be, one of the most successful and important features of our work this year.

Respectfully yours,

C. J. FIELD,

Chairman, Technical Committee.

For the month of May, the Committee on Runs and Tours announced three events. The first, a run to Babylon, L. I., and return, which was to have taken place May 5, was postponed.

The second was a run to Morris Park on May 12.

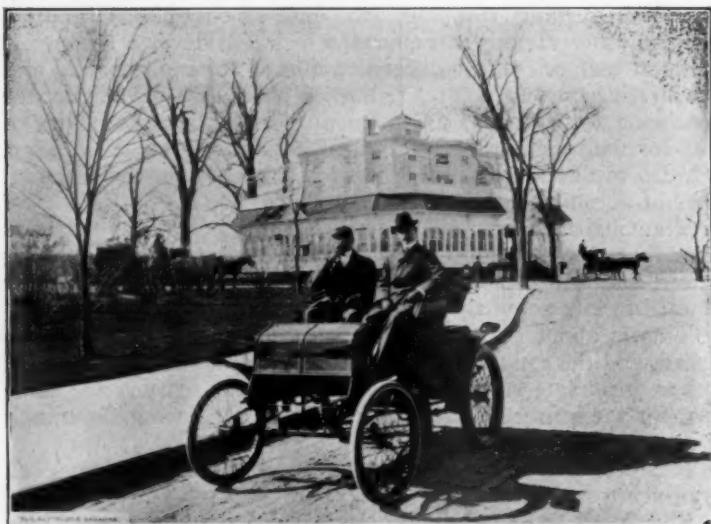
The third, a run to Nyack and return, May 19.

It was at first decided to make West Point the destination of the run of May 19, but after consideration the Committee on

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Runs and Tours decided the run would be too long and changed the destination to Nyack.

Due to the courtesy of Mr. D. H. Morris, the Automobile Club of America received an invitation from the Turf and Field Club to attend the races at Morris Park, May 12. The invitation was accepted and the start was made about noon from the Waldorf-Astoria. The run was under the conduct of Mr. Whitney Lyon. At the head of the line was Mr. D. H. Morris. Electric brakes, electric and steam runabouts, gasoline victorias, electric and gasoline phaetons, hunting traps and steam carriages were



J. Dunbar Wright in his Gasoline Carriage

the vehicles seen in the line. Captain Homer W. Hedge made the run in Mr. S. T. Davis's steam carriage, which machine, it will be remembered, finished second in the recent automobile race between Springfield and Babylon. None of the members of the club who took part in the run tried to see how quickly he could cover the distance from the Waldorf-Astoria to the track. All were purely on pleasure bent, and they made the journey to and from the course at moderate speed. They reached the track in about an hour, and the run homeward was made in the same time. While at the track the members of the club enjoyed the privileges of the club-house and had luncheon there.

Doings of the Automobile Club of America

Among the members who made the run were Mr. George F. Chamberlin, Vice-President of the organization, and at present Acting-President; Mr. George Ackerman, Mr. Whitney Lyon, Mr. Winslow E. Busby, Mr. Gibbs, Mr. J. C. McCoy, Mr. Bronson, Dr. E. C. Chamberlin, Mr. George H. Macy, Mr. E. E. Schwarzkopf, General George Moore Smith, Mr. F. A. La Roche, Mr. J. H. Wells, Mr. C. E. Corrigan, Mr. C. Hall, Mr. W. H. Hall, Mr. James J. Mandery and Captain Homer W. Hedge, Miss A. R. Shattuck was the only woman who took part in the run.

All the automobiles had power enough to make the journey homeward. Mr. W. H. Johnson, a member of the organization, was unable to start on the trip to the track at the time scheduled. He, with several guests, rode to the course later in the afternoon in an electric carriage. They made the run from the course to the Waldorf-Astoria with the other members.

The distance from the Waldorf-Astoria to Morris Park is about twelve miles. The route of the run from the hotel was as follows: Up Fifth avenue to One Hundred and Eleventh street, along Seventh avenue to Macomb's Dam Bridge, to Jerome avenue, thence to the course.

The cordiality shown in the tendering and acceptance of this invitation will assist materially in making clear the mistaken impression obtaining in some quarters as to the attitude assumed by automobilists toward horsemen.

In the absence of Mr. A. C. Bostwick, Mr. George Isham Scott was elected Chairman *pro tem.* for the Committee on Runs and Tours, on account of the recent bereavement to Mr. David Wolfe Bishop in the loss of his father.

In addition to the trial and test event the programme of the Committee on Runs and Tours includes a run, on June 16, to Bernardsville, and another, on June 30, to Asbury Park. This Committee has under its consideration at the present time a set of racing rules drafted by Mr. D. Wolfe Bishop.

Prior to his departure for Paris an informal planked shad luncheon was given by the club to M. Léonce Blanchet, at the Claremont, Riverside Drive, April 25. The club made this the occasion for the presentation to M. Blanchet of a handsome loving cup. M. Blanchet, it will be remembered, is the donor of the cup won by Mr. A. L. Riker in the recent 50 mile race on Long Island. The cup presented to M. Blanchet bears the inscription: "Presented by the Automobile Club of America to Mr. Léonce Blanchet in recognition of his interest in the sport in America."

Before the club, in the evening of April 28, Prof. R. H.

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Planked shad luncheon at Claremont, given to M. Léonce Blanchet by the Automobile Club of America.

Doings of the Automobile Club of America

Thurston, Director of the Sibley College, Cornell University, delivered a lecture on "The Trend of Progress in Automobile Construction." In his lecture Prof. Thurston presented the conditions that impede and those which favor the permanent and successful establishment of the automobile in the commercial field. The first installment of Prof. Thurston's lecture will be found elsewhere in this issue.

Following is the list of gentlemen elected to membership during the month of May:

Active Members—Frank C. Armstrong, H. M. Atkinson, E. T. Birdsall, G. B. Berckmans, George W. Bacon, Hon. Stewart M. Brice, Fred. B. Cochran, Malcolm W. Ford, Josiah M. Fiske, Charles J. Glidden, William H. Hall, Walther Luttgen, Erwin Lavens, Hiram Percy Maxim, Charles A. Metz, E. L. Powers, Edward E. Pettee, Isaac L. Rice, Isaac Robinson, T. H. Russell, W. K. Ryan, Kenneth A. Skinner, W. E. Scarritt, R. A. C. Smith, Thos. B. Stearns, O. F. Thomas, Arthur Turnbull, Herbert A. Wagner.

Associate Members—William D. Gash, Demming Jarvis, Ernest J. Knabe, Ubert K. Pettingill, F. E. Stanley, F. O. Stanley.

The club is ever growing, and at the present writing there are 232 members, 140 of which own automobiles.

At one of the recent meetings of the Board of Governors it was decided to make the presidents or acting chairmen of the automobile clubs of Great Britain, France, Belgium, Germany, Austria and Italy honorary members of the club.

A club book is now in preparation and will soon be in the hands of members.

Mr. Whitney Lyon will follow the other members of the club now in Paris early in June. A report comes from that city of the purchase by Mr. A. C. Bostwick of M. René de Knyff's famous Panhard which established the world's record at Pau and won the recent Nice-Marseilles race. The sum paid for the machine is said to be \$12,000.

THE FORTHCOMING AUTOMOBILE EXPOSITION

An automobile exposition will be held under the auspices of the Automobile Club of America at Madison Square Garden from November 3 to November 10, 1900. The committee appointed by Acting-President Chamberlin of the Automobile Club of America is as follows: A. R. Shattuck, Chairman, General George Moore Smith and E. E. Schwarzkopf. All inquiries relative to the exposition should be addressed to Frank W. Sanger, Manager, Madison Square Garden Co., New York City.

New York to Washington and Back in an Automobile

By George Isham Scott

In a few years a "horseless" trip from New York City to Washington, D. C., will doubtless be looked upon by the average automobilist as a very short jaunt, but to-day, when auto-touring is still in its infancy, and the long wished-for system of road-building is still unborn, the two hundred and fifteen odd miles separating the cities demand the services of an exceptionally good machine, were the tourist to make the journey with any degree of comfort.

To the recollection of the writer the trip between these points in self-propelled vehicles on the highways has been accomplished only twice; once in the summer of 1899, when a motor-cyclist rode and pushed his machine from Boston to Washington, and in April of this year, when a locomobile went through from New York, carrying the writer.

With two riders the little steam carriage started from New York in the A. M. of April 4. With goggles fixed, caps drawn over eyes and water-proof ulsters up over ears, the street urchins led us a merry dance to the Twenty-third Street Ferry. While crossing the river a crowd of curious passengers gathered about the machine, some offering information concerning its "make-up," mechanism and construction, others giving it their silent inspection—all interested.

Leaving the ferry-boat we rolled through the streets of Jersey City, holding our first consultation with L. A. W. directions. A turn to the left on a long line of asphalt led us to the Boulevard and to the Plank Road, on which we rode to Newark. Leaving Newark behind we went over a fine stretch of macadam to Elizabeth and to Rahway. From there, passing through Metuchen, New Brunswick was reached, where an L. A. W. road-house offered hospitality. At this point of the journey the road changes for the worse, and for 14 miles ugly ruts and "Thank-you-marms" are the attractions, as well as an occasional irate farmer.

At Princeton the tanks were refilled and the 10 miles to Trenton were swallowed in 25 minutes. Then began a series of troubles; roads deep in sand, toll-gates and horses, whose owners

New York to Washington and Back

cannot be persuaded that the road to Philadelphia is not a more pleasant one than that to Trenton. An amiable livery man was finally found in Philadelphia, when that city was reached, and our "steamer" went to bed for the night.

Shouldering our baggage we made a combined assault on a hotel dining-room. After two days in Philadelphia a single chauffeur sallied forth on the Lancaster Pike. Twenty miles of this "going" was bliss; trains were left, and slow toll-gate keepers were admonished to hasten, but after that, although the toll-gates continued to appear, the road became worse and worse



and worse, and when the Pike was left behind the real experience of rough riding began.

Notwithstanding the ruts and hills encountered in this span of the journey, the ride lacked not of pleasing features. Arriving at the Susquehanna the information was vouchsafed that as the ferry-boat had met with disaster it were necessary to have recourse to the train at Perryville. After a run of 5 miles along the bank of the river up and over a multitude of machine-testing hills, a flat-car brought the second day's journey to an end in Havre de Grace. After a good night's rest and a merry send-off in the morning, with a citizen for companion, the last day of the

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run south begun. As the carriage ran along, black legs scampered through farm-house doors and black heads appeared at windows, with voices raised in the never-failing exclamation, "Look at the carriage without a horse!" One objection made by a young woman of color was this, "Oh, go way, 'f I had one o' dem things I couldn't do no work; I'd jus' be flyin roun all atime." Then at any stop for oil or water, the regular series of remarks and questions, "How much is it worth; how fast can it go; look out, it's going to blow up; you don't need no horse for that thing," etc.

Two days in Washington, and under the escort of a small squad the start was made for New York. At Baltimore a combination of wet car tracks, gutter and carelessness were responsible for the loss of eight spokes. They were quickly replaced, however, and after two days' experience with mud, which frequently came up to the hub, Philadelphia was reached, via Wilmington. Leaving Philadelphia in the morning of April 14, and after both "steamer" and operator had become equally and unutterably lost in a cemetery, the old road was regained, and finally the ferry at Perth Amboy. From Tottenville the Staten Island Rapid Transit Railroad train was left one minute and a quarter in the rear over a distance of 12 miles, not a discreditable performance for a carriage having traveled over 600 miles on unspeakable roads. The 18 miles of road from Tottenville to St. George is the finest about New York, and resultant therefrom the ferry-boat made possible an arrival in New York in season for dinner.

AUTOMOBILES ON THE TOW-PATH

A new automobile, which is to displace mules as motive power on the tow paths, was tested recently on the banks of the Delaware and Raritan Canal, in the presence of several officials of the canal company. The automobile towed a hundred-ton boat at a rate of three miles an hour for a stretch of several miles.

Although the automobile weighed several tons, it towed the one hundred tons with ease. When it came to a standstill the strain behind gave it a pull backward in some way, and before the motorman could stop it it had backed down several feet in the water.

The officers of the canal company are satisfied with the test, and will place one of the automobiles at work at once. It is believed that they are each competent to haul six boats, at the rate of five miles an hour.

Trend of Progress of the Automobile

By R. H. Thurston

First Paper

THE automobile should be a self-moving carriage which, to be safe, reliable, comfortable, well-adapted to the special purpose proposed in its use, handy, as speedy as may be found desirable, light in proportion to power, compact, simple, elegant, manageable and inexpensive, both in first cost and in operation.

The problem of the designing engineer in this case is that of producing a design and plan which, when executed by the builder, shall fully meet the requirements of the proposing purchaser. He must ascertain what are the best materials for the several parts of the structure, must combine them in a carriage graceful, light, strong and comfortable, in machinery of maximum power with minimum weight and volume, combine carriage, machinery and running gear in such manner as to insure ample factors of safety in every part, while keeping down costs to those at which the market will take the automobile with a rapid and constant expansion of demand. The duty of the builder is to select the best material, standardize the dimensions and proportions of the several elements of the automobile, put together the carriage, the machinery and the running gear and erect the whole construction in a permanent and durable form and to make his manufacture so systematic and scientific that, making a standard automobile in sufficiently large lots, he can put it on the market at a reasonable price with a reasonable margin of profit to all interested—including the buyer.

The problem in design is much the same as that faced by the naval constructor and naval engineer when called upon to build an ironclad, or, perhaps, more accurately, a torpedo-boat, and that of the aeronaut, who, more than the engineer in any other branch of mechanical construction, is compelled to seek combined lightness and power as far as science and art combined can cooperate in solution of this most attractive and important of problems in engineering.

The carriage may be made of any form that may be found

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desirable and satisfying to the aesthetic instincts of the user. The removal of the animal from before it leaves the designer comparatively free to express his most artistic and most utilitarian ideas and to combine these often opposing demands in whatever manner his genius and inventive power may devise as the best combination or the best compromise possible. Great changes in form and decoration of the carriage will doubtless be found among the other modifications which will come of this entire freedom in design and construction of the carriage as a structure which can now be fitted to meet the requirements of the user as to comfort and elegance without being in any way hampered by compulsory adaptation to the peculiarities of the animal organization and temperament.

The running gear must be light, strong and capable of transmission of the impelling force; but otherwise of such design and proportions as shall best suit the user and subserve his primary purpose.

The motor must be just as light as is possible within the limits of entire safety. As the motor is a part of the non-paying load, as viewed from the economist's standpoint, its weight, however small, is a tax upon the automobilist, and the space occupied, however small and out of the way, is a waste also, either as loss of availability for stowage purposes or as detracting from the elegance of the automobile.

The selection of the type of motor for the purpose held in view by the designer is his first task, and experience has already shown that at least three motors are more or less adaptable to this work—steam, already used for a hundred years more or less successfully, the internal-combustion or gas-engine, also proposed for the purpose in the early part of the nineteenth century and lately employed quite extensively, and the electric current supplied by a "storage battery" or "accumulator" carried by the vehicle. The first is the oldest and best known, both as to its availability and its economies; the second has rivalled and in some directions outfooted steam in these later years; the third is used very extensively and is the ideal motor in its operation, but far from ideal in its endurance and its cost. Steam is troublesome and involves some risks, and is costly to maintain; the gasoline-engine and its relatives are subject to some objections in manipulation and in the character of the motor-fluid; electricity brings with it what at present are insuperable objections for general work and especially for long route operation, in its weight, bulk and great cost and limited quantity of energy-storage.

"The Trend of Progress" at present with this new apparatus

Trend of Progress of the Automobile

of transportation thus seems to be along a bifurcated, in fact a trifurcated, path. It is at the moment apparently true that no less than three distinct types of motor and as many types of automobile are finding use, and in considerable numbers, each in its own peculiar and specially suitable line of development: the steam-carriage, the electric vehicle and the internal combustion engine with its appropriate running parts. Whether these several lines of progress shall hereafter fall into one can perhaps be better guessed after some of the facts of the case are developed before the reader; but just now one can only guess the future. There is no definite knowledge to be obtained permitting a positive assertion. The probabilities may, perhaps, however, be stated after making a review of the practice of the day in its essential elements as bearing upon this question.

In reviewing the history of the possibly available motors for the automobile, one is struck by the curious fact that the most recent and the very lightest of all the existing types of modern heat-motors, employing steam as the working fluid, the steam-turbine, was actually known by the old Greeks and was described by Hero, two thousand years ago or more, and was even, possibly, old when Archimedes was seeking a lever-fulcrum from which to move the world. After all these centuries, the steam-engine has indeed caused the world to move and has given it an impetus in the single century just closing greater than had been acquired in the intervening centuries since Archimedes and Hero and their fellows of the Alexandrian era. How unfortunate that the old philosopher and engineer could not have found his fulcrum then and started this movement two millenniums earlier! It was not until 1680 that Sir Isaac Newton, proposing the construction of an automobile to be moved by steam, suggested the utilization of a form of aeolipile involving Hero's principle, that of reaction, as utilized in the Greek rotary steam-engine.*

Sir Isaac Newton was probably the first automobilist inventor, but, like many later inventors, unfortunately, he did not succeed with his scheme. The Cugnot carriage, of 1770, however, was a real and a working machine, and the antiquarian engineer or automobilist who chooses to study its construction at the *Conservatoire des Arts et Métiers*, in Paris, where it is still preserved in good order, will admit that, for its time, it was a remarkable bit of engineering.

One of the first inventors of the gas-engine, Brown, in 1827, proposed its use for steam-carriages, and the steam-carriage itself was the precursor of the railway. Watt's steam-engine of 1784,

* Manual of the Steam Engine, New York, J. Wiley & Sons; History of the Growth of the Steam-engine, New York, London, Paris and Leipzig.—R. H. T.

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his superintendent and manager, Murdoch's, model locomotive and automobile, and the full-sized and really successful steam-automobile constructions of Trevithick, at the commencement of the nineteenth century, were steps toward the modern automobile of no small importance and practicable automobiles thus antedated the railway.

The history of the automobile has illustrated well the tendency of the uninformed and the prejudiced populace to obstruct every economic movement essential to the most direct and effective social progress and to their own most rapid advancement. It was no sooner made a success by the inventors, mechanics and engineers of the early half of the nineteenth century than direct physical opposition and the restraints of legislation, urged in the interests of rival and less satisfactory methods of locomotion, brought the movement to a full stop, precisely as the same spirit had, in earlier days, destroyed Papin's steamboat and the "newly-invented" looms and the spinning frames of ruder times. It is only now that we find the legal pronouncement, through a New York court, that the ancient and inefficient must yield to the modern and efficient methods and mechanisms. Says this modern Solomon, recognizing the spirit of the age, "If one should find it desirable to go back to primitive methods and trek along a city street with a four-ox team and a wagon of the 'schooner' variety, it would possibly cause some uneasiness among the horses unused to such sights. Yet it could not be actionable, in my opinion, if a runaway should result, provided due care were shown not unnecessarily to interfere with the use of the highway. Horses may take fright at conveyances that have become obsolete as well as those which are novel; but this is one of the dangers incidental to the driving of horses and the fact cannot be interposed as a barrier to retrogression or progression in the method of locomotion. Bicycles used to frighten horses, but no right of action accrued. * * * The temporary inconveniences and dangers incident to the introduction of these modern and practical modes of travel upon the highway must be subordinate to the larger and permanent benefits to the public resulting from the adoption of the improvements which science and inventive skill have perfected."

(Second paper in next issue.)

An Automobile Trip in Algeria

By Ernest Archdeacon

M. ERNEST ARCHDEACON, the well-known Parisian *Chauffeur*, who recently spent several months in Algeria, has sent us a very interesting account of his trip in an automobile to the country of the cactus. We publish it in part, as we are convinced that it will interest all our readers.—*La Vie Au Grand Air.*

SCARCELY was I installed at Biskra than I could do no otherwise than send post-haste for my inseparable, beloved and faithful companion—my automobile. There was a special reason, too, that prompted me to this decision, and that was that I had learned at Biskra that no automobile had as yet



Mr. Archdeacon Initiating the Notabilities of Biskra in Automobilism

dared to brave the horrible roads of this region, nor had pressed the sand of the queen of the oasis beneath its wheels. To crown all, I had learned that M. de Talleyrand Perigord himself, one of the kings of the automobile, had not dared to brave them, and had come to Biskra a few days previously in a mail-coach drawn

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by eight Algerian mules. I immediately resolved to demonstrate by myself that, with boldness and a good carriage, it was materially possible to do what my eminent colleague had not done, and I wished to offer myself the innocent satisfaction of being the first to impress the soil of Biskra, which, up to then, had known the wheel of no automobile. No sooner said than done. I telegraphed to have the forwarding attended to, and a few days afterward my carriage was in the oasis.

In the vicinity of Biskra itself, I made but very few excursions, since the wretched state of the roads, or rather the absolute absence of roads, rendered the thing impossible. So I remained



Stalled in the Snow

there but a short time, and decided to go to Algiers by road. Nevertheless, I hesitated about leaving Biskra, since I knew full well that I should almost immediately meet with snow upon the high plains.

I speedily sent my carriage to Constantine by train, and left this city for Setif on January 24, first reaching Saint Amand at a distance of 15 miles therefrom. Starting from this place the snow reached a depth of over three feet in the cuttings. These last 15 miles were made of many hills, and it took us three hours to mount them. I remained ten times absolutely stalled in the snow, convinced every time that this stoppage would be the last and that it would be necessary to leave the carriage there.

An Automobile Trip in Algeria

Nevertheless, thanks to the combined energy of my road companion and engineer, the latter of whom dug passages in the snow with my carriage tools, I arrived at Setif at half-past five in the afternoon, without any other notable mishap than the breakage of the dash-board.

On the next day (January 25), we went to reconnoitre the road, and immediately found that it was radically impossible, almost at the very start from Setif, to avoid running against walls of frozen snow that reached a height of six feet in the cuttings. I never saw anything like it in my life, in France.

Numerous gangs of laborers were distributed along the road in order to clear the way, and according to the state of the work



Work of Clearing Away the Snow

it seemed certain that there was enough of it yet to be done to last for twenty-four hours. In fact, on the next day, we started at ten o'clock in the morning, but at $8\frac{1}{4}$ miles from Setif found ourselves again stalled before the eternal wall of snow. Finally, at noon, the cutting was sufficiently open, and we were the first to pass through it.

My engine, although very powerful, quite often operated without being of any aid to me, since, owing to the hardened snow that accumulated under the wheels, the motor caused the latter to revolve with great velocity upon the ice without compelling the carriage to move forward an inch. This fact prevented my companions from attempting to push against the wheels for fear of having their hands cut.

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A Difficult Passage Through Six Feet of Snow in Open Algeria

Finally, after accidents without number, such as the cutting of electric wires and the breakage of accumulators by the fearful shocks produced by the ruts in the roadway, we arrived all the same at Mansourah (72 miles from Setif) at half-past seven in the evening, by means of a road very ordinary in appearance, but astonishing in reality, seeing the incredible difficulties that had been encountered and the damages that were the consequence of them.

After repairing the damages of the preceding day, we left Mansourah at nine o'clock in the morning. After starting from this place, the snow disappeared completely, and the roads became repassable. In ordinary times, they must even be excellent.

We traversed the superb gorges of Palestro and reached the environs of Minerville, where we found the highway cut up. My resolution was soon formed, and I called for the assistance of fifteen men (with the promise of a *pour boire*), who were working upon the road. I got them to collect a very large number of flat and wide stones, and, by means of these, made them form two tracks just as far apart as the space between the wheels of my carriage, and just wide enough to support my large pneumatic tires, provided the steering was done in a straight direction.

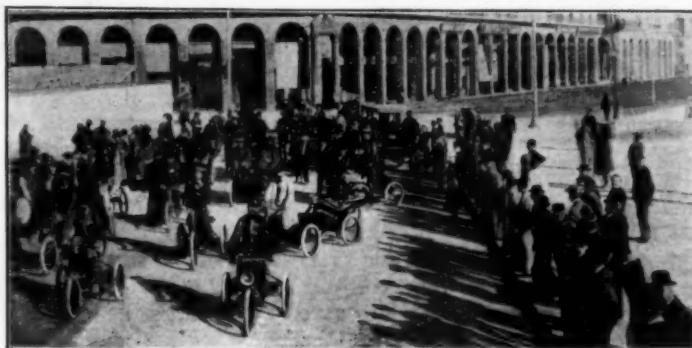
Upon reaching Algiers, I immediately met with a society of winter visitors, officers and colonists, who were all very much

An Automobile Trip in Algeria

interested in the automobile movement. Several, even, were owners of automobile vehicles.

I had not been in Algiers eight days before I knew everybody. People literally fought to see who should get me. Perhaps my carriage had a little to do with this general sympathy; but whatever the motive was, it afforded me pleasure all the same.

I collected the addresses of all the *chauffeurs* of Algiers and sent each of them an invitation to take part in a caravan excursion to Blidah. This was the first tentative of the kind that had ever been made in Algeria. I hoped to bring together fifteen *chauffeurs* at the most; but the result was thirty vehicles of all kinds and fifty-six *chauffeurs* and *chauffeuses*, who, having started from Algiers at 10 o'clock, were at noon seated at the



Rendezvous of the Chauffeurs, Boulevard Carnot, at Algiers, Before the Start of the Caravan for Blidah

Hôtel d'Orient around a huge table that had been prepared for them.

This was a triumphal success that astonished my Algerian colleagues themselves. Since they had never conceived the idea of assembling, they did not know their own strength or number.

Paris was certainly far from surmising the great development taken by the automobile in Algeria. Everything, in fact, in my opinion, should contribute towards such colossal and rapid development. The exceptional clemency of the climate, the beauty of the country, and, finally, the cheapness of living ought to have the effect of attracting thither all winter tourists who are lovers of the beauties of nature.

From a utilitarian point of view the development of the automobile in this country ought to be greater still. In fact, in addi-

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tion to the relative rarity of railways here, the transportation charges in Algeria are absolutely prohibitive; and so much so that the principal tradesmen of Algiers apprized me of the extraordinary fact that they effected a saving of 50 per cent. over railway charges in having their merchandise carried by camels!

The mail-coach tariff on the Algerian railways is double that of the railways of France. Fine country! Intelligent rulers!

In order to finish this note in a cheerful tone, I am going to tell, in a few words, how my carriage served for the exhibition of some female masqueraders. The following is the story: A merry band of eighteen charming Algerian girls had decided to celebrate Mardi-gras in an original manner. I may perhaps be indiscreet in saying that I really believe that some of them were star danseuses or chanteuses of the Theatre of Algiers.

The entire eighteen of them had dressed themselves in the same manner, and to this effect had adopted a superb yellow and green gown with a handsome cat of black velvet in the centre. After which, thus costumed and closely masked, it occurred to them to stroll through the city in a band and everywhere perplex the Algerian notables by calling them by name, whether they knew them but slightly or intimately.

After this they conceived a second brilliant idea, and that was to send a charming "delegation" to me in order to unfold a project and to suggest to me that, as a vehicle, my automobile would answer the purpose admirably. They offered me, in addition, a costume like their own, in order that I might be in uniform and not mar the effect of the *tout ensemble*!

No sooner proposed than accepted, with the reservation that the springs of my carriage might perhaps not be strong enough to support eighteen persons. I managed, however, to take as many as nine of them and divided the remainder among the automobiles of my friends. We defiled thus through the heart of the city for two hours, to the astonishment of everybody.

But the triumphant idea of the end was to go to finish the day at the races, for which all of the ladies had tickets.

Here my eighteen impetuous damsels intruded upon the operation of weighing, and tapped the abdomen of the most dignified officials, whom they addressed by their familiar name. After this the entire band departed in a body, and like a gust of wind, just as it had come.

It will be seen that Algeria is not only a fine and *fin-de-siecle* country, but also that people there do not allow themselves to worry.

The Automobile as a Civilizer

WHEN M. Léonce Blanchet, of the Automobile Club of France, offered a cup to be raced for by members of the Automobile Club of America, his sole object undoubtedly was to stimulate the exciting sport which has reached astounding proportions in France. The keen spirit of a true sportsman and a natural desire to witness a test of American mechanically propelled vehicles alone were the actuating motives. M. Blanchet must have been pleased indeed at the interest manifested by men in every walk of life, the goodly turnout of automobiles and the many lessons learned in the first true race ever held in the United States.

The famous Merrick road has been a great battle-ground for sports; speed and endurance tests of every description have been held on its firm level surface; horses of magnificent pedigree and world-wide record have sped neck and neck for supremacy. Cyclists have pedalled for fame or fortune in races of one to one thousand miles, and now the noted Long Island highway has added to its unsurpassed list the first great automobile race.

What did the run from Springfield to Babylon and return show the enthusiastic *chauffeur*, the interested but undecided future automobilist, the "general public," or the lover of sport? Certainly not which method of propulsion is the best for all-round use; still unsettled is the burning question of electricity, gas, steam. So it must remain; for many points are to be considered—cost per mile, ease of securing motive-power requisites, simplicity of working parts, etc., etc.

As yet the best strain of blood in horseflesh is unsettled; speed, endurance, size, weight and docility are seldom rightly combined in any animal.

To-day, as twenty years ago, cyclists are wide apart on wheel-base, length of crank and "gear."

Every factor possible of enumeration is of trifling importance compared with the one grand item—the entrance of the automobilists of the United States into the work for American civilization.

Good roads are a necessity and but one remove from the prime necessity of every civilized nation; first comes the school-house, then the road. No other country on the globe can compare with the United States in educational facilities open to all classes, all kinds of purses; to statistics proving this we "point with pride";

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further, no other civilized country has so many miserable roads; to statistics on this subject we do not point at all. In fact, few Americans do anything about the greatest of economic problems, beyond a passing malediction, a spasmodic annual remonstrance at Highway Commissioner or Road Master. Except in a few States no attempt is made to secure improved roads.

Ignorance, rather than indifference, causes the startling apathy on this subject among the voters of this great country. The politician is largely responsible; in his frantic efforts for re-election he strives to keep the tax-rate down and draws frightful pictures of ruinous cost, etc., etc. In reality, the cost of good roads would be but a small per cent. of the annual waste of material, labor and money in the annual farce played in almost every section of the United States called road-making.

The agriculturist for years fought road-improvement laws, the horse-owners were in opposition; but the cyclist coming in personal contact with poor roads, moaned and then studied the matter; the League of American Wheelmen was formed, and by statistics, by State-aid laws and by agitation gained supporters. Agricultural societies, village improvement societies and all thoughtful well-wishers of their country lent a hand. The gospel spread, at first slowly, and now a new and very powerful force, the automobilists, have appeared, not as reinforcements, but as a new army, working shoulder to shoulder with other enthusiasts in the good cause. Already their powerful aid has been shown, especially in New York State, and the fifty-mile race on the Merrick road means the start of a new crusade which perforce must carry all before it and give universally to the United States the one thing needed to place this country at the top in all branches of civilization: good roads.

BUENA FÉ.



A Clever Chauffeuse

THE wonderful achievements in all walks of life of the woman of to-day, has come almost to assume the proportions of the commonplace, so familiar have we become to the view of the various fields of her endeavor, and it



THE AUTOMOBILE MAGAZINE.

(Copyrighted, 1900, by T. K. Hastings.)
Miss Eva Mudge in her Locomobile

is only where versatility is added to her accomplishments that a new and startled interest is excited.

Among the many New York women whose possession of that quality has brought them into public view, few can be noted whose years can be numbered in the first score.

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Miss Eva Mudge, the clever daughter of Mr. R. C. Mudge, prominent in the Locomobile Company of America, is one. Miss Mudge is only eighteen years of age, and her versatility embraces the skill of the *chauffeuse* and the art of raising \$10,000 for charity. She has for some years past been engaged in entertaining select circles with song and impersonation. At six years of age she attracted public attention by her remarkable musical gifts, being engaged at that time to sing at a reception at the White House, Washington, D. C., by President and Mrs. Cleveland. Twice since that time she has appeared in entertainments at the White House, and has been constantly engaged in giving songs and recitals during the twelve years past. Miss Mudge has been specially noted for her warm interest in charity work, and two beautiful gold medals have been given her in commemoration of her services in this direction, one by her society and professional friends, and the other, set with diamonds, by the New York press. She enjoys the enviable distinction of having given more to the poor than any other girl of her age in the country. Her latest achievement is the rendition, in a Stonewall Jackson suit and hat, of the famous poem, "Barbara Frietchie," which aptly displays her accomplishments. The musical setting enables her the free use of a rich contralto voice. Miss Mudge is a lineal descendant of Zachariah Mudge, Prebendary of Exeter and Vicar of Plymouth, born 1680; and of Admiral Zachariah Mudge, of the English navy.

ELECTRIC CHARGING STATIONS ON THE ATLANTIC COAST

The New Jersey Electric Vehicle Transportation Company has arranged to install automobile stations during the summer season at the following points on the New Jersey coast: Seabright, West End (Long Branch), Allenhurst, Spring Lake and Atlantic City. At each of these stations Columbia vehicles, both electric and gasoline, of various designs will be for sale, and a specialty will be made of charging and caring for Columbia automobiles owned by private parties. The location of the various stations insures proper accommodations for vehicles and offers a large field for driving. Park wagonettes and omnibuses will be available for special service and for parties wishing to make trips through the surrounding country.

The New York Electric Vehicle Transportation Company has opened a salesroom at No. 541 Fifth avenue, New York City, where all types of Columbia automobiles are exhibited and where information regarding prices, etc., can be obtained.

A Challenge

NEW YORK, May 12, 1900.

Automobile Magazine,
No. 21 State Street, New York:

GENTLEMEN—The present war machines built by the Anglo-American Rapid Vehicle Company, under Mr. E. J. Pennington's patents, and known as the Pennington War Torpedo, which patents have been taken out in every country in the world where patents can be obtained, are without a doubt the fastest, lightest and strongest machines ever constructed, and to prove this statement I wish to make the following proposition to any and all comers who may wish to enter into competition against Mr. Pennington's machines, either in America, England, France, Germany, or any other country. Such test to take place in either one of the first four mentioned countries.

For oil driven or gasoline automobiles I will, at distances from 100 to 1,000 miles, give all such automobiles an allowance of 15 miles in every 100. In other words, while they do 85 miles our machines must do 100. For vehicles driven by steam, electricity, compressed air or any other power, we will give an allowance of 30 miles in every 100.

If the roads are extra heavy with sand or mud, and have extra hilly and rough surfaces, we will give an additional allowance of 5 to 10 miles in every 100, according to the condition of the roads.

This offer will hold good for acceptance for sixty days from this date. While these machines have not been built for racing purposes, but for war purposes, this matter of speed will show the ability of our vehicles for running over rough ground. I have myself ridden over plowed fields at 30 miles an hour, and have been a passenger of one among six on one of these machines when 64 miles an hour was easily obtained on a slight up grade.

All correspondence to be addressed to me at No. 20 Broad Street, New York.

Very truly yours,

H. B. TWYFORD,
Manager War Machine Department,
ANGLO-AMERICAN RAPID VEHICLE COMPANY (Inc.).

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(By Our Own Correspondent)

THE many always have to suffer for the misdeeds of the few. The reckless conduct of a comparatively small number of automobilists in dashing over the highways without regard to safety of life and limb, either for themselves or others, has stirred up public opinion against these abuses to so great an extent that the government has felt itself obliged to prohibit not only all such speeding on the roads, but even all road-racing, which has taken place under special permit. But the recent flagrant disregard of explicit regulations laid down in behalf of the safety of the public on such occasions that characterized certain of the participants in a recent road-race, led the authorities to take summary action. This action prohibits absolutely the various great races that had been planned as special attractions this season in honor of the Exposition. Enormous pressure will be brought to bear to secure a modification of the decree in favor of these events. Whether it will be successful remains to be seen. This was to be the first year of the great international contest for the James Gordon Bennett Cup, and the annual Paris-Bordeaux race has come to be, as M. Serpollet says, the Derby of the automobile for France. There is a belief that the feeling will soon blow over, and that the great races will be permitted, after all. But there is no telling what the outcome will be. Many of the leaders in the industry, as well as sport, stand aghast and take a gloomy view of the future, unless the decree is modified. M. Charron, for instance, says that the commercial results of the interdict will be disastrous, meaning an arrest of development for the whole industry. He says that without the incentive given by racing the great improvements made in the automobile would never have been seen. There are others, however, who think that this view of the matter is too serious. The automobile has progressed so far as to be beyond danger of harm from such a decree. On the contrary, they say, while the interest aroused by racing has led to certain improvements, the great advance has been not in the achievement of qualities of speed, but in those matters that make the automobile an all-round practical vehicle. The future of the automobile lies with its popularity with the great public, and for this end it must be a vehicle of common utility, safe and convenient, and adapt-

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"THE AUTOMOBILE MAGAZINE."

Finish of René de Knyff at Marseilles

120 miles in 3h 25m 30s

able to all the manifold uses for which the horse is now employed. It must be something more than a new toy, a racing-machine, which will be cast aside in fashionable regard with the arrival of some new fad. Therefore there are even those who maintain that the true interests of the automobile will benefit by the interdiction of its use in a manner that makes it a danger to all users of the public highways.

It is estimated that in June of this year there will be at least 12,000 automobile vehicles of various descriptions in use in France, against 5,000 a year ago. This prodigious increase has called the attention of the government to the importance of further regulation of the new form of locomotion. The Minister of Public Works has therefore constituted a commission to study the subject with special reference to the imposition of new restrictions as to sound-signals, police measures relative to traversing collections of people on the road, and distinctive marks on vehicles. The commission is composed of eleven members. MM. Jozon, Councillor of State, Director of Routes, Navigation and Mines, as President; Forestier, Inspector General of Bridges and Highways; Mourier, Master of Requetes in the Council of State; Michel Levy, Chief-Engineer of Mines; Collomp, Chief of the Bureau of Urban, Neighborhood and Rural Transit; de Zuylen, President of the Automobile Club of France; Ballif, President of the Touring Club; Commandant Krebs, Constructor; Pierre Giffard, Publicist; Rudolphe Darzens, Publicist; and Walckenaer, Chief Engineer of Mines, Secretary. Eight of the commissioners are practical *chauffeurs* and members of the Automobile Club. Pierre Giffard, one of the members, is editor of *Le Velo*,

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and in an article in that paper he advocates doing away with sound-signals entirely. He says that the noise of the motor is sufficient. As to distinctive marks, he favors a special name upon every vehicle beside the number of the same.

Here in France the automobile industry now gives employment to no less than 180,000 persons.

An automobile club has been organized in Avignon with Joseph Pernod as President.

During the Exposition the Berlin Gesellschaft für Verkehrsunternehmen (Company for Traffic Enterprise) is running here in Paris 12 electric vehicles with 12 seats each especially to take German tourists to and from places of interest in and around Paris.

The first automobile recently arrived at Biskra, greatly to the astonishment of the Arabs of the desert. The honor of this achievement belongs to M. Ernest Archdeacon, who left Batna at eleven o'clock in the forenoon in a heavy snowstorm with over a foot of snow on the ground, reached El-Kantara at one o'clock and left at two o'clock, arriving at Biskra at 4.30 o'clock, the total distance being 121 kilometres. The party entered the oasis with its date-palms under a beautiful warm sun. The automobile was a magnificent eight-seated vehicle.

The statistics for horse-runaway accidents for France show that in the second half of the year 1899 there were 3,278 persons injured from this cause, and 314 killed. In December alone there were 656 persons injured and 52 killed. In the same six months there were 164 persons injured by automobile accidents and 91 killed. Probably the most of the automobile accidents were occasioned by high speeding and reckless driving, which are altogether too common in France.

The record for the month of February gives the number of accidents due to frightened horses as 757, resulting in 57 deaths and 700 injuries. In the same month there were 25 automobile accidents, none of which were fatal. There were also 43 bicycle accidents, 4 of which resulted in death.

The Société libre d'emulation du commerce et de l'industrie de la Seine inférieure has offered a prize of 1,000 francs and a diploma for the greatest progress in automobilism as applied to small urban traffic, represented by vehicles of the four-wheeled voiture class, called "voitures de place." The prize is to be given either in cash or in a medal of gold inscribed with the winner's name and the remainder in cash, as may be preferred.

The Automobile Club of France has now a membership of 2,301. Among the recently elected members are Frederick

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Brackett, General Secretary of the United States Commission at the Paris Exposition, and H. Hulbert, Director of Groups for the United States Commission.

M. Felix Dubois, the explorer, has returned from a sojourn in the Soudan, whither he went to establish an automobile service between the Senegal and the Niger. The installation has been very successful, the vehicles working admirably, in spite of the bad condition of a part of the route.

A distance of nearly a hundred miles without recharging is the remarkable record of an electromobile recently driven by M. Louis Krieger. The journey was from Paris to Dijon, a distance of 152 kilometres.



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The Endurance Car
The Endurance Motor Company

The Automobile Club of Great Britain has arranged with the festival committee of Dieppe for an international automobile festival to take place in northern France on June 17, 18 and 19. At the head of the festival will be the Mayor of Dieppe and the British Vice-Consul in that city. The event of the first day will be an international course over a route yet to be selected. The second day there will be a grand festival of flowers, together with short distance courses. The third day will be devoted to a handicap course from Dieppe to Rouen and Beauvais, returning to Rouen. Participation in this course will be limited to British automobilists and members of the Automobile Club of Great Britain. The rules followed will be those of the Automobile

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M. Lorraine Barrow in His 12 H. P. Daimler

Club of France and the committee will be appointed by the British club.

Two British automobilists, Messrs. Cambell Muir and Worsley, recently made the journey from Stuttgart to Havre. They made the 170 kilometres from Stuttgart to Strassburg in seven hours; from Strassburg to Nancy, 155 kilometres, in a snow-storm, in five hours; Nancy to La Fère—Champenoise, 220 kilometres, in six hours; Le Fère—Champenoise to Paris, 132 kilometres, in five hours; Paris to Rouen, 136 kilometres, in four hours, and Rouen to Havre, 92 kilometres, in three hours—a total of thirty hours on the road.

The Princess of Wales has recently ordered a four-seated automobile of a Coventry manufacturer.

The British Ministry of War has advertised for bids for furnishing five motor-wagons with a carrying capacity of two tons each and a speed of five miles an hour.

M. Crouan's first motor car is now completed; it contains many features of novelty. The motor is said to have four horizontal balanced cylinders, developing 20 H. P. Compressed air,

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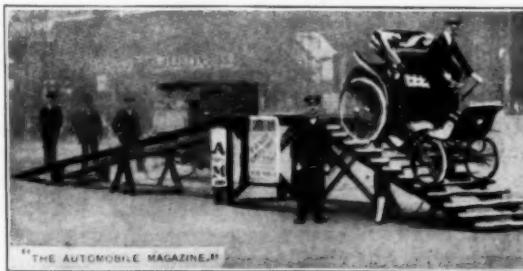


Coles Driving Hewetson's Benz Car up an Incline of 1 in 4

obtained by utilizing the pressure of the exhaust gases, is employed for actuating the change-speed gearing. Considerable interest is centred upon this new vehicle, as M. Crouan's previous experimental cars have shown great promise.

A novel idea, which should appeal to the managers of your continuous-performance theatres, is that of automobile trick-riding on the stage. A most interesting demonstration has recently been a feature at the Alhambra in London, where E. J. Coles, an expert driver, gave an exhibition of fancy driving. One feat was the driving of an ordinary Benz carriage with a hood, weighing 850 pounds, up a slope 18 feet long with a 25 per cent. gradient to a platform 6 feet by 5, and thence down a flight of 17 steps with 10-inch treads and 4-inch risers, on a slope of one in three. Another feature was fancy driving in graceful curves and twists in and out among flags and blocks.

The automobile section of the Glasgow International Exhibition of next year promises to be a particularly attractive and important feature. The special cement track will offer good opportunities for speeding and racing. The exhibits of the



Coles Driving the Benz Car Down a Flight of Steps

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motor-vehicle class will be located in the Locomotion and Transport Section.

The second annual exhibition of the Automobile Club of Great Britain was held at Agricultural Hall. It showed rapid progress on the part of the industry in Great Britain. The gasoline type was particularly in evidence.

An Automobile Exhibition Company has been organized in Berlin for the purpose of establishing a permanent show of automobiles in the German capital, with the idea of bringing seller and purchaser into closer relations. A most favorable location, close to the Friedrichstrasse railway station, and conveniently reached from all parts of the city, has been obtained, with a floor space of about 1,200 square metres, beside a considerable extent of additional room available, part enclosed and part open towards the street. Place will be given to everything of interest relating to the automobile. It is intended to make it a permanent international automobile exhibition. Numerous applications for space have been received. Chief Engineer Freund, who was a technical member of the direction of the International Motor-Vehicle Exhibition at Berlin last year, has been engaged to direct the undertaking. The address of the management is Dorotheenstrasse 6, Berlin, N. W.

In the course of the Nuremberg automobile exhibition there will be several runs from that city. In the latter part of June there will be a long-distance run to Bamberg, Schweinfurth, Würzburg, Ochsenfurth, Uffenheim, and Ausbach, and thence back to Nuremberg. Among several shorter runs arranged for will be one to Erlangen, Heroldsberg, Neumarkt and Schwabach.

A novelty at a swell ball in Berlin this season was the entrance of a four-seated automobile under the guidance of Herr Siegfried Blum. It was handled with such dexterity as to make its way with great rapidity about the hall, threading its way in and out among the crowded company.

The Sultan of Turkey has decorated Herr E. Kühlstein, of the Kühlstein Automobile Works of Charlottenburg, near Berlin, with the Medjidie order.

The Central European Motor-Vehicle Society (Mitteleuropäischer Motorwagen Verein) of Germany had 563 members at the beginning of the year. Of these 192 belong in Berlin, and the cities of Cologne, Stuttgart, Dresden, Munich, Dusseldorf, Hamburg, Frankfort on the Main, Hanover, Leipzig, Mannheim, Nuremberg, Breslau and Augsburg are well represented. There are 34 members in Austria-Hungary, and other countries represented are Switzerland, Sweden, England, Holland, France, Bel-

The Automobile Abroad

gium, Russia, Italy and America. Two-thirds of the members are manufacturers or their representatives, and technical men connected with the industry.

The Thuringian Forest in Germany, with its enchanting mountain scenery and perfect park-like roads, has become a favorite resort for automobile excursions. The Mitteldeutsche (Central German) Automobile Club of Eisenach has performed an excellent service by establishing automobile repair and benzine-supply stations at all principal points throughout Thuringia, designating them by conspicuous signs.

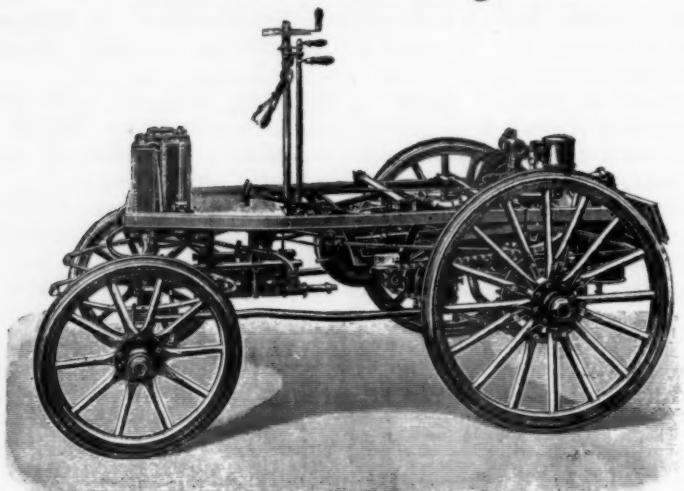
The German military budget for this year contains an item of 175,000 marks for continuing the experiments with the automobile for ambulance and ammunition purposes. The Minister of War, von Gossler, said that the automobile had shown itself greatly superior to animal traction for such purposes, but further experiments were desirable.

A great manufacturing consolidation has lately taken place in Berlin. The Motorfahrzeug-und Motoren Fabrik Berlin, Actiengesellschaft Marienfelde (Berlin Motor-Vehicle and Motor Factory, Marienfelde Stock Company) has increased its capital by 5,000,000 marks and formed a consolidation with the Gesellschaft für Verkehrsunternehmungen Berlin (Berlin Company for Traffic Undertakings). The consolidated companies have a magnificent exhibit at the Paris Exposition, including numerous electric vehicles and a wholly new type of automobile with benzine motor.

The Trades Union Association of Wurtemberg have made the experiment of founding a motor company for purchasing and renting small motors to artisans and petty manufacturers. The rent for such motors is to be paid monthly and goes on interest on the capital invested. The motor can, at any time, be exchanged for one of larger dimensions. The company are also enabled to sell motors outright at a much lower rate than they can be bought by such manufacturers direct. The result of this experiment may be awaited with a good deal of interest, and, if favorable, will doubtless find imitators.

The Railway Brigade are at present making trial trips with a six-seated automobile on the Tempelhofer Feld, Berlin. The vehicle is manned by an officer and five sappers, and has hitherto given perfect satisfaction. The steam generator is in the front of the vehicle. This is only one of many trials lately made in army circles with horseless vehicles, which it is proposed to introduce for supplying the advanced firing line with ammunition and for transporting the wounded.

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Benz & Co. Auto-frame

Benz & Co., of Manheim, Germany, deliver now to carriage and wagon builders automobile frames with all machinery attached, a specimen of which is illustrated herewith. This enables carriage builders to supply any body desired.

The Vienna automobile exhibition opens towards the end of May. It will be located in the sixth section of the Royal-Imperial Agricultural Society's building, adjoining the rotunda. There will be a great automobile corso, with a track 500 metres long. A special attraction will be an automobile omnibus service between the centre of the city and the Praterstern, with low fares for visitors to the exhibition.



Vienna Automobile Exposition and Racing Track

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Consul General Alexander Singer recently made the trip from Vienna to Nice with a six horse-power Bollée vehicle.

The Austrian Society of Automobilföhrer (automobile drivers) has regular courses of instruction given in 15 lessons of two hours each, twice a week from 7 to 9 o'clock in the evening. Membership in the Society is required in order to take the course. Members of the working classes pay the entrance fee and so much a week; those who are not workingmen pay for the lessons in advance at double rates. There is a theoretical course and a practical course. There is also a special course for the coachmen of Vienna.

The Bavarian and the Austrian Automobile Clubs are to join in a race from Munich to Vienna early in June, under the new rules of the Austrian Club. There will be exhibitions in Munich, Salzburg and Vienna.

Prince Alfred Wrede, of Vienna, has asked for a concession for a motor-omnibus line between Graz and Eggenberg.

In the Tyrol they appear to be alive to the advantages of the automobile. In Bozen, Bruneck and Ampezzo the authorities have been considering no less than twelve distinct propositions for motor-omnibus lines between different localities. One of the new lines is that between Toblach and Cortina. Experimental trips on this line have given most satisfactory results. Railway connection is made in Toblach.

Brussels is to have a public automobile service with six-seated wagonettes. The tariff will be five francs an hour for two persons and an addition of one franc for each additional person. For six persons the charge will be 11 francs, and for each additional hour 10 francs.

Attention is called to Java as an excellent country for the automobile. The sultry climate is disastrous for horses, and the entire island is threaded by perfect roads which, with the delightful tropical scenery, make automobile touring a constant delight. The bicycle is greatly in vogue there and the automobile is undoubtedly destined to like popularity. At last accounts, however, there were only two in use on the island.

Slipping, Creeping and Sliding

WHEN a railway-train rounds a curve, its speed is limited to a degree dependent upon the radius of the arc as well as its inclination from the road. In order to counteract the effect of centrifugal force, the inner rail is slightly raised so as to incline the cars within the curve. The car-wheels are held and guided on the tracks by their flanges.

But an automobile, in rounding a curve, is unprovided with any means for counteracting the effect of centrifugal force. The road must be taken as it is. For this reason the speed must be reduced and the greatest care taken in passing around corners.

Centrifugal force tends constantly to throw the carriage within the curve, and, when there are no inclines—which is the general rule—is counteracted only by friction between the tires and the ground. When the road is slippery and the centrifugal force, owing to the speed, rather great, equilibrium is destroyed, and "slipping" takes place; that is, the carriage, in gliding on its wheels, is thrown without the curve. Slipping is always dangerous, because it cannot be checked.

There is another phenomenon observed in automobiles, which is easily confused with slipping, because its effect is almost the same. It must, however, be distinguished from slipping because its origin is different. The phenomenon I speak of is that of "creeping."

No road is perfectly horizontal. Its section is a curve, the summit or highest point of which is in alignment with the axis of the road. Only when the vehicle is in the middle of the road, are two wheels of the same axle on a level. Under these conditions, the wheels are horizontal; and the highest point of the road is located between them, slightly above their treads.

The road usually pursued is inclined, from which it follows that the weight of the vehicle, which always acts vertically downward, is not normal to the road. This weight is a force which can be resolved into two component forces, one acting perpendicularly to the road and causing the adherence of the wheels, and the other acting parallel to the axle and tending to produce creeping. The first force is usually the more powerful; but its superiority is overcome by the second when the ground is slippery and the inclination considerable.

Creeping increases with the weight; for the adherence does not become greater as the weight augments. But the force

Slipping, Creeping and Sliding

acting parallel to the axle is dependent upon the weight and its effect is therefore all the more dangerous. On an arched road the side within the curve should always be selected.

"In running a carriage on the highways," writes George Moreau, in his work on Explosion Engines, "a highly trained hand and an exceedingly good judgment are required, when the speed is at all great. When an obstacle is to be avoided or a carriage to be passed the longest possible curve should be described in order to avoid the slipping which results from the action of the centrifugal force invariably produced when the carriage deviates from its rectilinear path. Moreover, the necessity of leaving the centre of the road causes the carriage to run at an incline, if the road be dome-shaped in cross-section. This inclination, coupled with the centrifugal force, may cause serious danger, if an unforeseen obstacle be encountered. No set rules can be given in this matter. The driver must know his carriage, *must feel with it*. With a vehicle whose every member he knows thoroughly, a good automobilist can perform feats in perfect safety, which the most elementary considerations of prudence would forbid."

Sometimes it happens that when the carriage is running along at an incline, the steering-gear refuses to work, with the result that there is a slipping of the steering-truck. When the carriage is running in a straight line, the propelling forces can be resolved into four parallel forces acting in the planes of the wheels. But when the inclination of the front wheels is changed, the forces acting on these wheels can be resolved into two forces, one acting in the plane of the wheel, the other parallel to the axle. The second may be greater than the first, and hence produce a slipping which will vary with the rapidity with which the *chauffeur* desires to operate the steering-gear and with the adhesion of the tires to the ground. The two forces combine to give rise to a movement oblique to the plane of the wheel.

Slipping may also be caused by the ill-timed action of the differential. In all carriages, the differential has a certain influence on the steering-gear. When the brakes are applied and the wheels are running on ground in which the coefficient of adhesion is variable, one of the wheels will stop before the other, and the carriage will therefore pivot about the wheel which should have been the first to stop, *i. e.*, about the wheel on that portion of the ground having the least adhesion. The wheels carry the vehicle along by friction on the ground—a friction which constitutes what is termed the adherence. On the other hand the ground forces the wheels to rotate in spite of the brakes, when the

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adherence is considerable. If, at the time, the front wheels are not on ground to which they can adhere, or if the driver does not energetically operate the steering mechanism, the carriage will slip to such a degree that it may be completely turned about. A similar result is produced if instead of braking the differential, the brakes be applied on the rear wheels.

SLIDING

A wheel slides or "skates," as it is sometimes called, when it rotates without changing its position relatively to the ground, or when its speed at the rim is greater than its speed of translation. The phenomenon is caused by the expenditure of more power than is necessary to overcome the resistance.

Although sliding should be prevented as much as possible, it cannot be entirely obviated even in the best conducted carriage. Jolts cannot be altogether avoided; and the moment the driving-wheels leave the road, though it be but for a fraction of a second, the motive force, no longer being counterbalanced by the resistance at the rim, causes an acceleration in the operative mechanism; and the wheels, when they come into contact with the ground, have acquired a peripheral speed greater than that with which they were rotating before they left the road, or, in other words, greater than the speed of translation. Hence the wheel slides. Since the motive force is always less than the adherence, sliding soon ceases, and the wheel rolls along as it should.

In a suspended carriage, the springs have a certain effect on the sliding of the wheels. The various movements of the carriage-body sometimes have the effect of reducing the load of the motor. It may happen that by reason of a particularly sharp movement, the load, for the moment, may be so far reduced that the adherence falls below the motive force, with the result that the wheels slip.

Finally, inequalities in the road have something to do with the slipping of the wheels. When a wheel meets with a short declivity or a rut, the resistance at the rim may be reduced; and if this reduction be sufficient, slipping may ensue.

This tendency to slipping possessed by all carriages in common, should not give rise to anxiety. Reasonable care should be taken to prevent continued slipping; for the tires may otherwise be subjected to undue wear and the driving-mechanism damaged.

The remedy for the evil is clearly to reduce the motive power, and if necessary to stop the motor.

H. VERNIER.



Mr. H. P. Whitney's Columbia Gasoline Voiturette

MR. HARRY PAYNE WHITNEY has come into possession of what is decidedly the best gasoline voiturette of American manufacture.

Mr. Whitney operates this machine daily between his country seat in Old Westbury, L. I., and New York City, a distance of 30 miles, which he covers in less than two hours.

The voiturette illustrated above is the machine in question. It is the latest creation of the Electric Vehicle Co. of New York, and was built at their factories in Hartford.

The vehicle carries a single cylinder motor of 4 horse-power cooled by water and having three speeds, the maximum of which is 20 miles per hour. The speed-changing gears are housed in a carterie running in oil.

The water tank, which is situated in the front of the vehicle with the lubricating reservoir, holds 4 gallons and is equipped with cooling radiators. The gasoline tank, which has a capacity of 5 gallons, is situated with the carbureter and accumulator for ignition, under the seat. Rear of the seat there is a spacious compartment for the storage of extra gasoline, tools, baggage, etc. The machine, which is shaft-driven, is equipped also with a backing device and is steered by a wheel. The carriage seats two people and weighs 1,400 pounds.

Gallery of American Automobiles



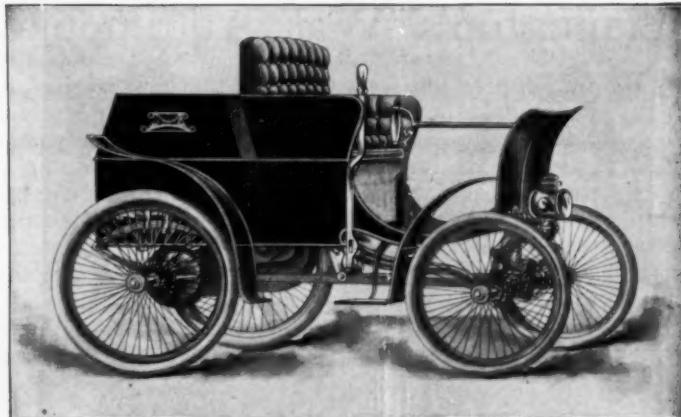
Columbia Gasolene Delivery Tricycle



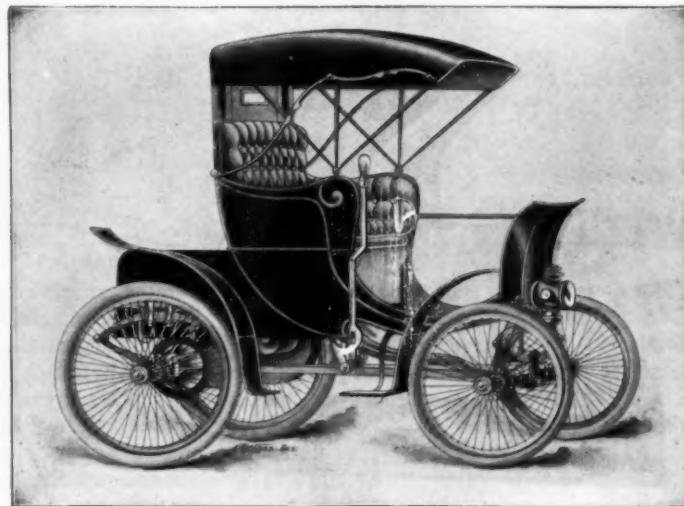
"THE AUTOMOBILE MAGAZINE."

Gasolene Runabout of the Autocar Company, Ardmore, Pa.

Gallery of American Automobiles



Touring Cart of the Detroit Automobile Company



Phaeton of the Detroit Automobile Company

Pennington's War Automobile

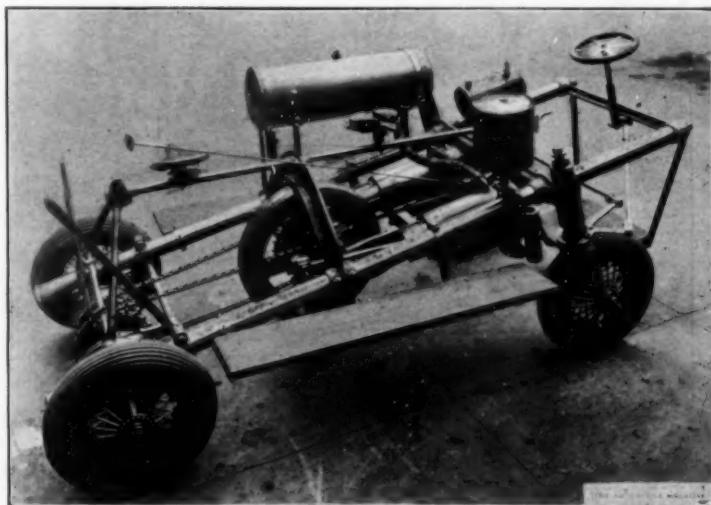
THE Garvin Machine Company when they first received the order to build the Pennington Automobile War Machines for the Anglo-American Rapid Vehicle Company, were very skeptical as to the results which would be attained, and in view of the very unsatisfactory experiences which they have previously had in building automobiles, they were very reluctant to undertake the order. The contracts which they have executed in the past have always proven unsatisfactory for the reason that the vehicles, when completed, never came up to expectations.



The construction of the machines and all details are covered by Mr. Pennington's patents, and after they had gone carefully through his drawings they found that he had, by the practical details, set forth all the necessary requirements for the automobile. In eight weeks from the time the drawings came into the works Mr. Pennington took the first war machine out on the road. This rapid construction is due to the personal supervision which he gave to them and their efficient workmanship. Such a powerful and speedy machine of this character has never previously been constructed for use on public highways and general country work. There are two cylinders each $6\frac{1}{4}$ inches by 12

Pennington's War Automobile

inches, mounted in a frame of steel tubing and manganese bronze. By some very clever patents Mr. Pennington is enabled to dispense with a carburetor and feeding his oil into the combustion chamber by a very simple process. The machines are fitted with both electric and hot tube ignition. There are two speed gears running from the crank shaft on either side of the fly-wheel to the driving shaft, the transmission being by chains. When the motor is running at its normal speed the machine will travel at the rate of 25 to 30 miles an hour on the lower gear, and 60 to 75 miles an hour on the higher gear, according to the condition of the road.



Although a great deal of skepticism was evident as to the machine fulfilling the prognostications of Mr. Pennington, we subsequently found that the trial fully came up and even surpassed the assertion that he had made as to its capabilities. This was in a great measure due to the very careful working out of the details in the drawings which he furnished. This enabled the workmen to put the machine together without any hitch whatever, and was also the means of its proving such an entire success on its initial trip.

The various tests which have been made in the past two weeks have brought out very prominently the merits of the machine. It has been timed for several half miles, making them easily in 27

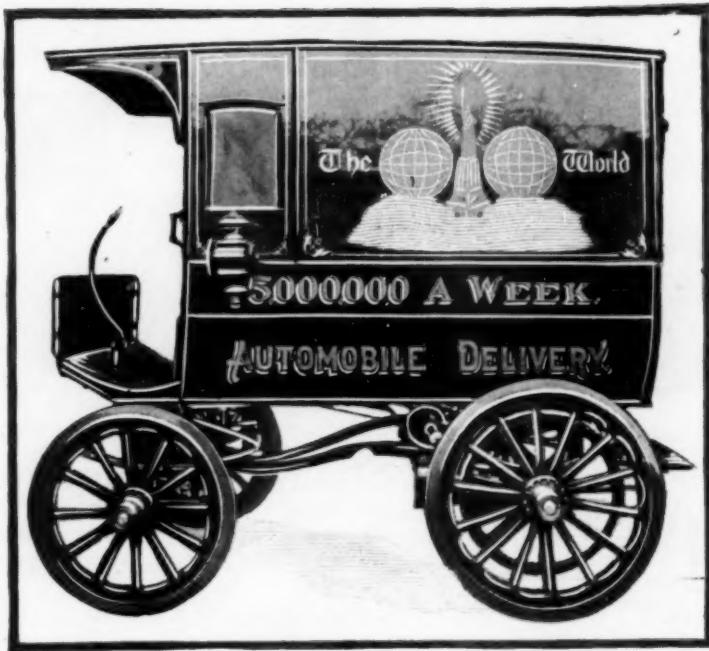
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seconds, and miles in 53 to 55 seconds. The machine being built expressly for war purposes, it was essential that it should be adapted for very rough work; several tests were therefore given it on very rough country roads and across ploughed fields, where it maintained a speed of 20 to 30 miles per hour. One cause for the favorable results obtained from this very rough country work is that the wheels are only 22 inches in diameter, which absolutely prevents the machine from being upset. The tires also add greatly to the value of the vehicle for this class of work, as they are specially built from Mr. Pennington's designs, being 5 inches in diameter and bolted to the rim with 20 lugs. The amount of oil and water which is carried enables the machine to be run at



any of the speeds mentioned above for 500 miles without stopping.

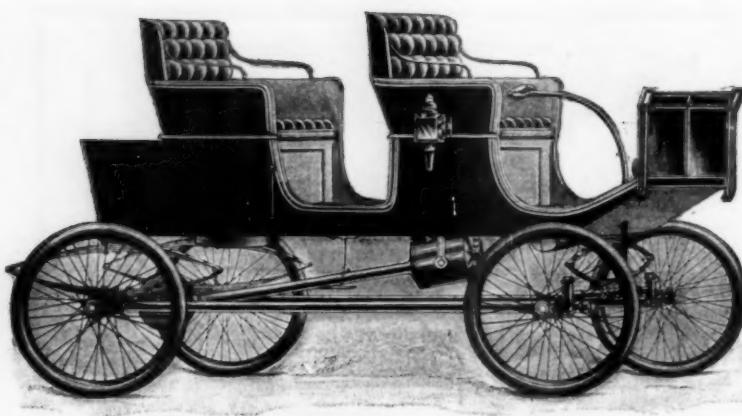
It is the intention to have these Torpedo War Machines mounted with rapid firing guns and protected by armor plating. These will be of much greater service in war times than the armor trains which have been in use in South Africa, as they are strictly confined to the railway tracks, and are only of use when they have a locomotive attached. There are many other purposes for which the Automobile War Machines will be utilized, such as pulling ammunition wagons, provision and forage wagons. There are five more of these machines almost completed, and those which are intended for racing will be fitted with wind shields, while those which are to be utilized for war purposes will be fitted with the armor plating when they arrive in England.



Newspaper Delivery Automobiles

THE New York *World*, with its usual brilliant efforts to keep pace with the advanced age, has recently introduced the automobile into its circulation service for carrying and delivering newspapers in New York City and vicinity. One of the first of a large number ordered from the Woods Motor Vehicle Co. is now being used for the purpose, having been tested under various conditions, with most satisfactory results. The machine has answered all the requirements imposed by weight carrying, grade climbing and speed, and will obviate the thousand and one difficulties incident to the employment of horses in this capacity.

Heretofore the safe and speedy delivery of daily newspapers has been a problem with which circulation managers have long struggled, and the *World's* adoption of the new form of locomotion undoubtedly will bring with it the solution.



"Century" Steam Carriage

THE above illustration shows a two-seat steam carriage built by the Century Motor Vehicle Company, of Syracuse, N. Y.

The driving mechanism of this carriage is the same as that used in all vehicles manufactured by this company. The engine is directly connected to the gear shaft at the forward end and the set of bevel gears, connecting the rear end of the gear shaft to the rear axle. The rear axle of all their vehicles is so constructed that the driving power is applied to the centre of the axle, the compensating gears being also located at that point and at the same time having a solid rear axle that is not cut in two at the centre. This is claimed as being one of their special features and calculated to make a very rigid axle without adding to the weight or complication of the construction.

This vehicle is controlled by means of a steering lever which also controls the speed of the engine; the driver sitting on the left side of the vehicle as in all of their other styles, using his right hand to steer, stop and start.

The weight is about 1,150 pounds, complete, without top. Strength is not sacrificed in vehicles of this kind in order to make an abnormally light machine; also the machines are not geared so high to obtain a high speed that they will not easily draw themselves out of mud, and sand holes, or run up steep hills without overtaxing the engine and boiler.

“Century” Steam Carriage

The engine is pivotally connected to the sills of the body under the front seat in such a manner that it allows of all movement of the body caused by variable weight of the load in the same, and it allows of other movements caused by uneven road, etc.

This company make their own wheels, gears or frames, bodies, engines, boilers, and, in fact, nearly all principal parts, as they have found it extremely difficult to obtain properly proportioned equipments suitable for their vehicles.

They use in their wheels laminated wood rims of a heavy section, made according to their own specifications, and the tire lugs are spaced in such a manner that the rim is not weakened on account of one or more of the lugs coming close to the spoke hole. The spokes are of the very best possible quality, swaged pattern with the reduced centre. The nipples are of hard brass and of liberal proportions. The hubs and bearings being of their own construction and designed for the use intended.

Parts are made to templets and gauges, interchangeable ball bearings are used throughout, and the ball bearing cones and ball races are made from tool steel and tempered.

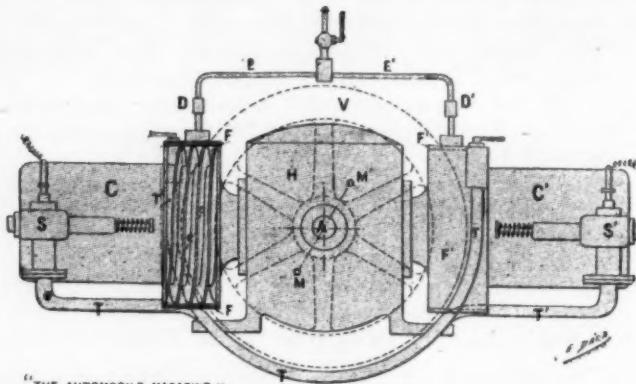
The bodies in these vehicles are made with heavy substantial sills, are framed heavily and are fitted with $\frac{1}{2}$ -inch panels. All parts of the body are blind screwed and glued.

AUTOMOBILE OMNIBUSES FOR THE PUBLIC

The important privileges secured by the Fifth Avenue Coach Company under recent legislation should make that company an important factor in the transit problems of New York. Beside the regular license charged by the City for stage-coaches and omnibuses the company is obliged to pay to the City five per cent. of its gross receipts. The company has the right to charge ten cents for a continuous trip. Since it is subsidiary to the New York Electric Vehicle and Transportation Company, controlled by Mr. William C. Whitney and his associates, who also control all the surface-transit lines of Manhattan, the Fifth Avenue Company will naturally be operated in harmony with those interests. The company not only has the franchise for Fifth avenue, but, with the approval of the Railroad Commissioners, it can extend its lines through any other streets of the city. It is intended to have the Fifth avenue service complete by a year hence. The regular vehicles will be large double-deck affairs, with seats for 28 passengers. Several of these will soon be in operation.

The Martha Alcohol Motor

ALTHOUGH there is nothing particularly remarkable about the Martha alcohol motor, in so far as its cylinder, piston, connecting rod, etc., are concerned, it nevertheless possesses one peculiar feature worthy of note, and that is that it operates apparently without a carbureter, properly so called. More accurately speaking, the system of carburation is so new that any one would hesitate to apply to the combination of parts that concur therein the name of carbureter adopted by our present terminology. Nevertheless, for want of another

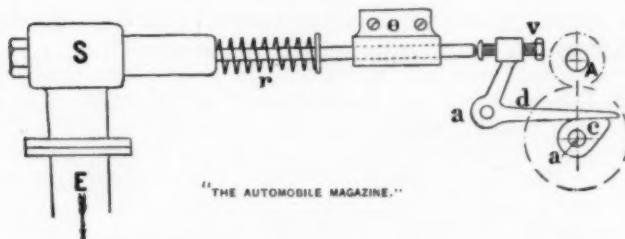


term, we shall have to describe the apparatus under the name of the "Martha Carbureter."

An inspection of Fig. 1 will show that M. Martha has arranged at the head of each of the cylinders of his motor a worm formed of three spirals enclosed in a casing, *F*. At the entrance of this helicoidal conduit is situated the principal air inlet, which is provided with a valve, *D*, of which the upper stem, pointed at the extremity, prevents the entrance of the alcohol. At the top of the last spiral there is a second regulatable air inlet.

At the time of the suction—at the moment at which the valve allows the air to enter, the passage of the alcohol occurs. At the same time, the latter becomes heated in contact with the cylinder and keeps on flowing, while the suction of air continues through the aperture in the last spiral.

The Martha Alcohol Motor



"THE AUTOMOBILE MAGAZINE."

The alcohol, volatilized during this passage between two strata of air, becomes intimately blended therewith. The detonating mixture thus obtained is absolutely homogeneous and reaches the cylinder ready to be compressed and ignited. It is to be remarked that since this mixture has been formed in the helicoidal conduit, the temperature of which is quite high, it has undergone expansion. It follows that, if it were admitted into the explosion chamber in this state, the entire power of the motor would not be utilized. This is why the inventor makes it pass beforehand through the radiating tubes, $T T'$, that surround the fly-wheel. This latter, through the displacement of the air that it occasions, cools the tubes and reduces the mixture to a normal volume.

For this principle of utilizing the waste heat of the motor, which thereby becomes cooled, and which favors the intimacy



Side View of the Martha Alcohol Carriage

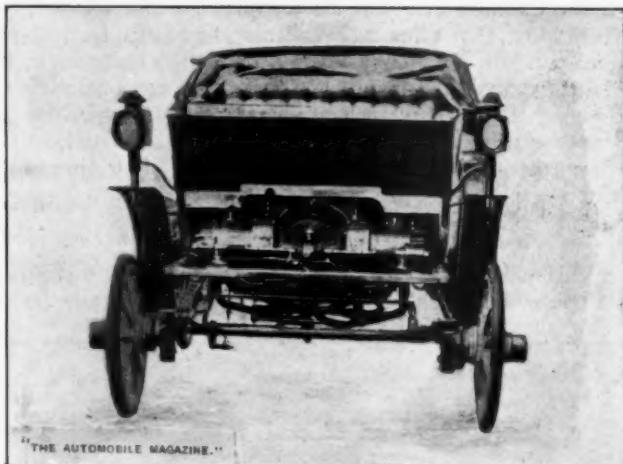
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of the mixture that is subsequently reduced to a smaller volume, the inventor has been granted a patent in Germany.

It is evident that this device may be greatly reduced in bulk and be placed upon the exhaust tube or the muffle, and thus become applicable to all existing motors.

With the Martha carbureter, whatever be its temperature, the motor always starts in a cold state, at the first stroke of the piston, and even with ordinary sophisticated alcohol.

The trifling vaporization of which we have spoken suffices to start the motor, and, after the first explosion has taken place, the heat of the cylinder or that of the exhaust will be sufficient to assure the normal velocity, which may be regulated in a few



Front View of the Martha Alcohol Carriage

seconds through the air orifices. The entire loss of alcohol in starting is but from 3 to 4 cubic centimetres.

From what has been said, it will be seen that carburation with alcohol is as easy as it is with gasoline; and, what is an immense advantage is that, aside from the fact that the entire amount of the hydro-carbureted liquid is utilized, atmospheric influences—heat or cold, dryness or humidity, are not to be apprehended with this system. How many carbureters are there of which so much could be said?

In conclusion, it should be stated that the arrangement under consideration operates equally well with carbureted alcohol and gasoline.



A New German Motor-Carriage

ALTHOUGH the tricycle and the voiturette are the types of motor-vehicles most commonly used in Europe, they do not fully meet the requirements of the buying public. Often they are built far too light; and their motive power is so small that they cannot be driven to the summit of every hill. The vibration is sometimes too perceptible; and the seat is not ample enough for the occupants.

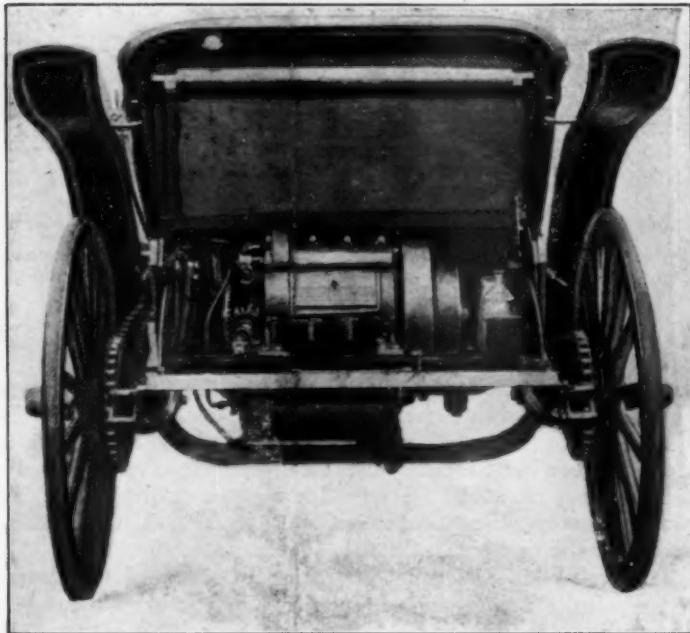
The well-known German engineer, Vollmer, of Charlottenburg, Berlin, the inventor of the fore-carriage which has been successfully introduced in the United States by the Vollmer Fore-carriage Syndicate, has overcome these objections in a vehicle, the making of which has been undertaken by Kuehlstein. In designing his carriage Vollmer was chiefly concerned with the provision and disposition of his motive power so that he could ascend heavy grades regardless of the character of the road.

His motor and auxiliary driving mechanism are mounted upon a straight frame—an arrangement which enables him to employ a wagon-body of any form and readily to make any repairs in his motor. The wagon-body is firmly held upon the frame by 4-6 bolts, but can be removed in less than five minutes.

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The frame is connected with the axles by elastic springs, so that the mechanism will not be jarred. The moving parts are all inclosed in dust-proof casings and run in oil.

The motor is of the two-cylinder type and is horizontally mounted beneath the carriage-seat. The fuel employed is benzin. The energy developed is $4\frac{1}{2}$ -5 horse power. The cylinders are cooled by a single water-jacket, the water being circulated by means of a pump driven by the motor. The cooling-water for the cylinders is contained in a reservoir carried in the front



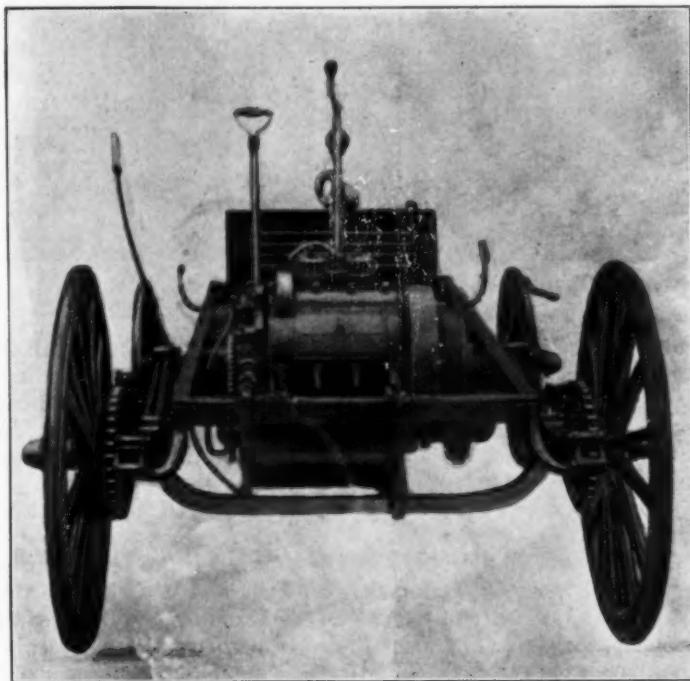
of the carriage and concealed by the front seat. The water is cooled by a system of coiled pipes in such a manner that the quantity contained within the reservoir will last for a run of 62 miles. The coiled pipes are located beneath the front of the carriage, so that as few obstructions as possible are offered to the air.

The benzin used as fuel is stored in a flat, metallic receptacle built in the rear wall of the carriage. The receptacle contains enough benzin to enable the carriage to cover a distance of 62 to

A New German Motor-Carriage

75 miles. From the storage receptacle the benzin is automatically fed to the carbureter in quantities exactly sufficient for the requirements of the motor at a given moment.

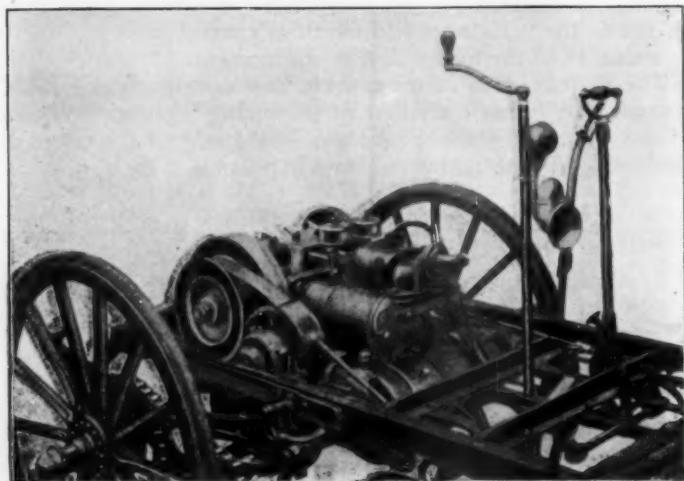
The carbureter is of an entirely new construction. Besides its small size, it has the merit of producing a constantly homogeneous mixture of vapor and air. Clogging of the inlets and overflowing of the carbureter are impossible. By means of a



gauge secured to the carbureter, the *chauffeur* can determine at what level the benzin should be, in order most efficiently to control the carburation. The proportions of the constituents of the explosive mixture can be regulated by a small handle at one side of the driver's seat.

The gas is electrically discharged. The spark-coil used is connected with an accumulator. Two accumulators are provided, each capable of yielding current for about forty hours. When

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one accumulator is exhausted, the other can be connected with the spark-coil. Both accumulators and the coil are inclosed in a small box beneath the driver's seat. In order to drive the carriage at different speeds, the ignition can be regulated. The *chauffeur* is therefore enabled to run his motor at a low speed when his carriage is stationary.

The vehicle can be driven at a speed of 8, 18, or 27-35 kilometres (5, 11, or 17-22 miles) per hour.

The energy of the motor is transmitted by a new form of clutch to an encased gearing connected by a chain with the rear or driving wheels of the carriage. The usual reversing-gear is dispensed with; for the friction-mechanism enables the vehicle to be driven backwards. This friction mechanism consists of a disk which can be moved into or out of engagement with a second disk on the fly-wheel of the motor, by means of a vertical lever within reach of the driver's hand. When the first-named disk is thrown into action, the carriage is driven backwards; when the disk is withdrawn from the fly-wheel, the carriage is driven forward by a pulley and a belt tightened up by the lever mechanism. The arrangement, it is claimed, possesses an advantage over gear-wheels, since there are no teeth to break off. It is likewise claimed that many of the difficulties attending the use of the belt have been overcome.

A New German Motor-Carriage

The different speeds are obtained by throwing into action the proper gear-wheels of a speed-changing gear inclosed in a water and dust proof casing. The particular gear-wheel corresponding with a certain speed can be thrown into action by operating a handle combined with the starting-lever.

The weight of the entire carriage is 1,550 pounds. The vehicle is made heavier than most automobiles of its size, because it has been found that the lighter German motor-cars are unable to travel for any great length of time over poor roads. The gain in durability more than compensates for the added weight.

Lubrication is confined to the filling of the connecting-rod cups and the cylinder-cups. All the other parts are automatically oiled.

A MOTOR BATH CHAIR



Mr. Worby W. Beaumont

One of the founder members of the Automobile Club of Great Britain.

This machine is an adaptation of the well-known "Coventry Chair," but the power for propulsion, instead of being supplied by the rear-rider, is generated by a De Dion Motor. The direction and control are entirely in the hands of the man at the back. The passenger in front is carried in a very comfortable and easily sprung wicker chair.

A New Starting Device for Motors

WE illustrate herewith the details of a ratchet-wheel arrangement for starting the motor of automobiles, recently patented by the De Dion-Bouton establishment. In Fig. 1 is shown a section through the axis of the mechanism, and in Fig. 2 a section on the line A B of Fig. 1.

In these figures, *a* is a shaft connected with the driving shaft through a gearing which is keyed at *b* and gives a proper ratio of speed; while *c* represents a portion of the carriage frame. Upon the shaft *a* freely revolves a chain sprocket, *d*, of which the hub is prolonged on one side and carries a ratchet-wheel, *f*.

To the extremity of this same shaft, there is keyed a circular box, *g*, which is cast in one piece with three curved members, *h*, in the concavity of which work the lower extremities of the clicks, *i*, that engage with the teeth of the ratchet-wheel. These clicks are capable of turning freely, and are held in place solely by the box *g* on one side, and by a properly adjusted cover, *j*, on the other.

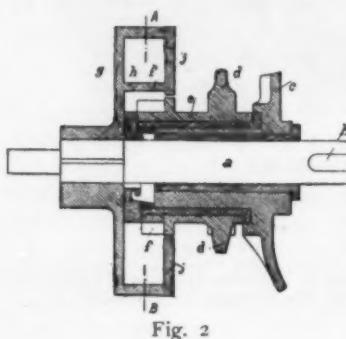


Fig. 2

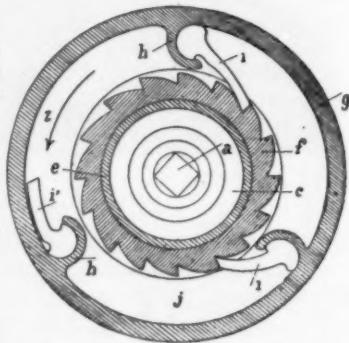


Fig. 1

To the chain sprocket, *d*, there may be imparted a continuous motion through an appropriate mechanism within the driver's reach.

The operation of the apparatus is as follows: In order to set the motor in operation, the driver, through the means at his disposal, revolves the sprocket *d* and the ratchet-wheel operatively connected therewith.

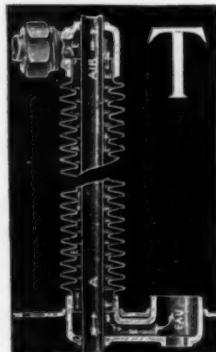
A New Starting Device for Motors

The ratchet-wheel, in acting upon the clicks adjusted in the box, causes the latter, as well as the shaft to which it is keyed, to revolve.

The motion of this shaft is transmitted, with a proper ratio of velocity, to the shaft of the motor, which, after a certain number of revolutions, will begin to run spontaneously. Starting from this moment, the shaft *a* and the box *g* will be revolved by the motor; and, since the rotary velocity is very great, the box will revolve faster than the ratchet-wheel. The clicks, *i*, through the effect of centrifugal force, will assume the position, *i'*, in which they will be completely disengaged from the teeth of the ratchet-wheel.

If, for any cause, the motor should happen to cease running, the clicks would again engage with the teeth of the ratchet-wheel. In order to effect a fresh start, it is only necessary to revolve the sprocket *d* in the direction shown by the arrow *z*. Then, after the motor has begun to operate, the carriage would be started by the usual methods.

The Apprin Radiator



THE Apprin radiator consists of a corrugated iron tube surrounding an ordinary tube with parallel walls. The water circulates in the space between the inner tube and its jacket, the corrugations of which are in contact with the air.

The result of such an arrangement is that a better rendering is obtained than with ordinary radiators, owing to the increase in conductivity and in the surface of contact with the air.

The construction and operation of this apparatus are so well exhibited in the accompanying figure as to need no extended description. It is only necessary to add this to what has been said: In order to facilitate the entrance and exit of the air when currents of the latter happen to be flowing in a direction parallel with the corrugations, the ends of the tubes must be bevelled in contrary directions.

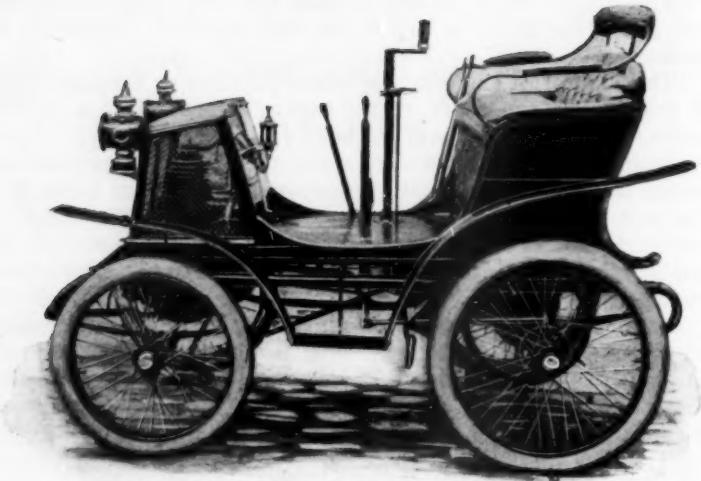


Fig. 1. The Underberg Voiturette

The Underberg Voiturette

THE voiturette represented in perspective, elevation and plan in the accompanying engravings, has been recently brought out by M. Underberg, a manufacturer at Nantes.

The motor, which is of the Gaillardet type, of $3\frac{1}{4}$ horse-power, and cooled by flanges instead of by a circulation of water, is placed in front, at *M* (Fig. 3). It actuates, through gearings, an intermediate shaft, *A*, upon which are mounted four toothed wheels that may be thrown into engagement with corresponding toothed wheels mounted upon the shaft *B*. This latter carries a pulley, *P*, which, through a belt, *E*, transmits its motion to a second pulley, *P'*, keyed upon the differential gear carried by the hind axle. A friction clutch placed upon the receiving gearing permits of effecting the changes of speed (four in number) without stopping the motor, since the clutch is operated by means of a pedal.

The motor is set in operation through a crank fixed in front of the carriage, and which is thrown out of gear automatically, as soon as the motor has started. Then the driver gets into the carriage, and, acting upon a lever, *L*, placed to his right, throws the mechanism into gear by slightly displacing the rear axle, which stretches the belt. The changes of speed are con-

The Underberg Voiturette

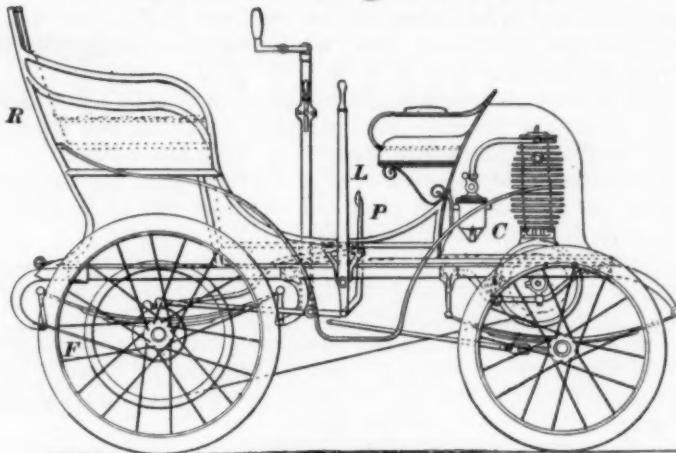


Fig. 2. Elevation

trolled by the lever *L*, which shifts upon the shaft *A* the sleeve that carries the gearings.

The carbureter, *C*, which is a constant-level and automatic one, is supplied by the reservoir, *R*, placed in the back part of the carriage. When it becomes necessary, it is heated through a pipe connected with the exhaust of the motor. A double cock controlled by levers placed upon the hollow steering bar, permits of proportioning the mixture of air and gasoline vapor to be introduced into the cylinder. The driver has at his disposal two

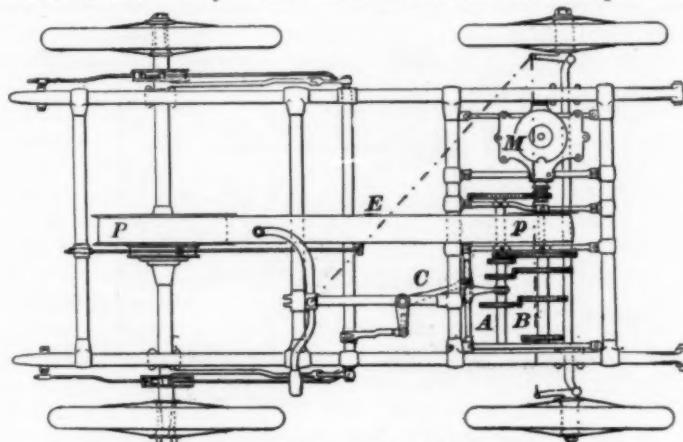


Fig. 3. Plan of Frame with Belt Transmission

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brakes that are independent of one another, and one of which acts upon the differential gear, while the other acts upon the hubs of the wheels.

The ignition is produced by an induction spark; and a lever placed upon the steering bar permits of varying the point at which the discharging of the gaseous mixture takes place.

The carriage represented in Fig. 1 is designed for two passengers, but a bracket seat placed in front permits of carrying a third person or a piece of baggage.

Upon an experimental trial, this carriage has given a maximum speed of 21 miles an hour upon a level, and a mean speed of 15. It is capable of climbing an up-grade of 12 per cent.

The frame is constructed of seamless steel tubes, and is carried by four springs, while the body is carried by three. This method of two-fold spring support prevents all jarring and jolting.

In order to meet the requirements of those who do not wish a transmission by belts, M. Underberg is manufacturing a type in which the transmission is effected by gearings.

The plan of the frame of such a carriage may be seen in Fig. 4. At *M* is the motor, placed in front as in the carriage provided with a belt; *C* is the carburetor; *CF* is the friction clutch; *G* is the lubricator; *V* is the speed-changing lever; *P* is the bevel wheel that controls the toothed wheel placed upon the differential gear, *D*; and *FF'* are the brakes upon the hind wheels.

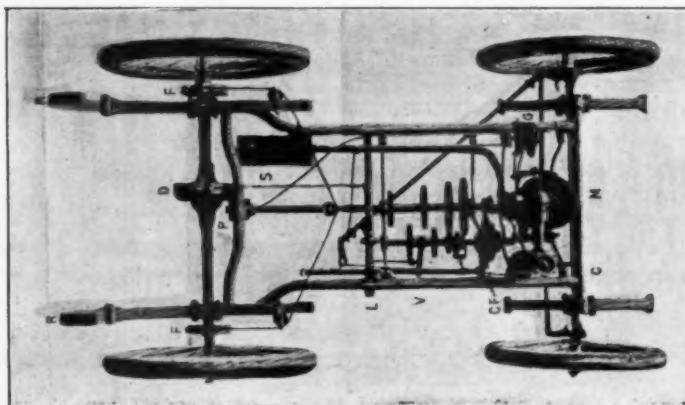


Fig. 4. Plan of Frame with Transmissions by Gearings

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Editorial Comment

A BAN UPON ROAD-RACING

THE excessive prevalence of road-racing in France, which has been peculiarly the home of the sport, has had the inevitable result. With the multiplication of motor-vehicles in that country the habit of reckless driving, and the increasing frequency with which highways were converted from their legitimate uses for traffic into race-courses, has made travel more and more dangerous, has given rise to more and more accidents, and at last public sentiment has been so aroused as to call for severely repressive measures. It is high time the matter was taken in hand by the authorities, as it has been, with a view to efficient regulation of the whole subject. Else, even in spite of the enormous growth of automobile interests in that country, there would be the gravest danger of public opinion becoming so violently hostile as to retard the course of development very seriously.

The final strain upon the forbearance of the authorities was given by the accident caused by the carelessness of the participants in the recent Paris-Roubaix race, who recklessly disregarded the precautions that they were bound to observe. The Prefect of the Seine and Oise gave permission for the race only

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on the express condition that whenever those taking part should approach any gathering of people, or any groups walking along the road, they should at once slacken speed to the pace of a walk. In consequence of the numerous accidents that have lately occurred the Prefect has absolutely forbidden all motorcycle races upon the highways in his department. Unless this order is modified it will make impossible the great races which were to be a remarkable feature of the present season, including that for the International Cup and that from Paris to Bordeaux, for both of which great preparations have been made and large expenditures incurred.

These developments have led the government to appoint a special commission to consider the subject of what regulations are necessary for the use of the automobile on the public highways, particularly in relation to signals by sound, police regulations for passing collections of people, and distinctive marks for vehicles.

While it would be a serious disappointment for many persons, and particularly to the intending participants who have gone to so much trouble and expense in their preparations, it would be a good thing both for automobile interests at large and for the public in general if road-racing should be absolutely prohibited from now on, with perhaps exceptions in favor of these two races for which such elaborate arrangements have been made. But after that France would do well to forbid road-racing for once and all, and other countries should adopt a like course.

There is little to be gained for automobile interests from such contests. The great thing desired is to introduce the automobile as extensively and as rapidly as possible. One great advantage of the new form of locomotion is its superiority to animal traction in the point of safety. But road-racing emphasizes the aspect of danger and inevitably tends to make that aspect prominent in the public eye, while making the highways more unsafe than ever. Extremely high speed is one of the least desirable things in automobile practice. It is compatible with neither safety nor comfort. For rapid transit the highways can never be expected to rival the railways, in spite of the phenomenal speed attained by the automobile in recent road trials. Road-racing with horses is prohibited nearly everywhere in this country, and there is no reason why exception should be made in favor of the automobile. Bicycle road-racing was recently in great vogue with us, just as automobile road-racing has been in France. In Massachusetts special permits were given for the purpose. But it became such a nuisance that it is now forbidden there and in various other parts of this country.

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For emergency use there is an advantage in high speed possibilities. On a good rural road, with a free course ahead, there is no harm in spurts of high speed when safeguarded by proper steering and checking appliances and the necessary skill in guidance. While the law limits speed on the highways to certain moderate rates, under such circumstances it is nowhere observed either with horses or bicycles, and it is not expected that it will be. Neither would automobilists be expected to regard it strictly. But it should be remembered that at the present stages of development the automobile is viewed with distrust, not to say hostility, by a large and influential portion of the community. It is necessary that the opposition from such sources should be disarmed by practical demonstration of the advantages of the new form of locomotion. But if road-racing and reckless speeding are to be indulged in, a strong public sentiment against the automobile will surely be stirred up. And one result will be likely to be the imposition of such restrictions upon construction that, through gearing or other devices, it would be impossible to exceed the legal maximum in speed. This would prevent a resort to high speed for emergency purposes or on occasions when no harm could result therefrom, all of which would be exceedingly unfortunate.

The sentiment of the Automobile Club of America is happily very strongly against road-racing. This should be a strong factor in discouraging the practice in this country. In Great Britain the development is very wholesome. The regulations against road-racing are stringent and are strictly enforced. The Automobile Club of Great Britain has just been enjoying a great thousand-mile tour of the country, in the entire course of which there was no racing. An occasion of that sort is of immense benefit in the promotion of public interest and the gaining of popular favor. It is in such directions, together with the achievement of universal good roads, that our energies should be bent in this country.

The automobile is a great time-saver. But practically this is not because of extremely high speed, but rather on account of moderate celerity, of promptness in starting and stopping, and steadfast maintenance of average speed in place of the dawdling movements of the horse whenever conditions of grade, etc., are in the least unfavorable.

There are, indeed, certain interesting and advantageous aspects of the automobile as a high-speed vehicle, and there is a great fascination in automobile racing. As in the case of the horse and the bicycle, however, automobile speed trials and contests should be confined exclusively to specially prepared and

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enclosed courses, or to public speedways specially set apart for the purpose. Under such conditions the sport has a great future. As to road contests, they will be useful—as in the case of the great thousand-mile run in England—when restricted to other points than speed.

THE PRESERVATION OF THE PEDESTRIAN'S RIGHT AND SAFETY

There are, at present, in the City of New York about 1,000 automobiles and the prediction is justified that this figure shall be trebled before October and that May, 1901, will find about 10,000 of these new vehicles in operation in the streets of the metropolis.

The horse-car, the cable-car, the electric-car, the bicycle, all have gradually created new conditions. The automobile will do the same and the popular adjustment to the latest form of locomotion will be no less marked than that which developed in the successive introductions of improved traction.

In its introduction a much better speed-performance was expected from the electric-car than that given by its predecessors, the horse-car and cable-car, and it cannot be expected that the speed of the automobile will be as low as that of a hippomobile.

In order to determine what constitutes a reasonable speed to be allowed in the locomotion of automobiles two points have to be considered:

1st—At what shortest distance, traveling at a given speed, can an automobile be safely stopped?

2d—What curb can an automobile, traveling at a given speed, take with safety?

Comparative trials made with a horse and an automobile have answered the questions propounded above in the "stopping" and "curb" performances of an automobile running at the speed of 22 miles an hour as against those of a horse at the speed of 12 miles an hour.

All kinds of locomotion naturally dissembling each other have to be reconciled as to speed, and the time, therefore, has come when great cities like New York will have to make extensive provision for the future locomotion of the automobile.

The automobile, to-day in the minority, will be, in no distant day, in the majority, and the rapid approach of the time behoves a contemplation of the necessities resultant therefrom.

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The underground rapid transit system when completed will, of course, absorb a large part of New York's street traffic, but even with the realization of this gigantic innovation consideration must be given the pedestrian, lacking calculation for whom no plan of street transit is perfect. In line with this a preliminary suggestion is offered:

Why could there not be constructed on overcrowded crossings in Broadway, at intersections similar to those at Fourteenth, Twenty-third, Thirty-fourth and Forty-second streets, movable ramps similar to those now in operation at the Paris Exposition?

The adoption of such devices would certainly tend to eliminate the element of danger and greatly facilitate pedestrian transit at the congested points of the city. This manner of handling masses of people has proven entirely successful at the Exposition, previous to the opening of which this matter was indeed a problem, the solution of which was urgently sought.

The question of procuring power for these movable ramps has, also, been answered in Paris by the application of electricity which, contributing power to various things, including illumination, elevators, etc., also lends power to the ramps. After the substitution of electricity for cable in Broadway, why could not the fluid employed to run cars be harnessed to the various ramps?

In our opinion the sooner steps are taken toward such an arrangement the better it will be for all concerned.

A great imagination is not required to appreciate the good to be derived therefrom.

Respectfully submitted to and for the consideration of the Municipal Council of Greater New York.

ALCOHOL FOR MOTIVE-POWER

Much interest was aroused by the article on the use of alcohol for motive-power in our May number. The facts set forth were a revelation to the most of our readers. It was surprising to learn that alcohol had been used in automobile practice both in France and Germany, and that in the latter country it compared favorably with petroleum spirits in cheapness. The result in Germany is due to the fact that in that country alcohol used in the arts is exempt from taxation. This sagacious policy has been of inestimable benefit in the industrial development of Germany, and it would exert a corresponding benefit here, should our government have the wisdom to adopt a similarly enlightened policy. There is no particular difficulty in the way. All that is required is to "degrade" the spirits designed for such

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use by the admixture of some simple and inexpensive substance that makes them unfit for drinking. It would then be impossible to devote such spirits to illegitimate uses.

The objections that are raised to the adoption of the policy by our government are based upon the trouble which it would occasion and the loss of revenue that would ensue. The trouble has been enormously magnified. There is no reason why the "degrading" process should not take place under the supervision of the national revenue authorities just as easily as it is done in Germany. As to the loss of revenue, in reality there would be practically nothing—the merest fraction of a trifle in comparison with the gain from the enormous industrial development that would follow. We are in the habit of calling ourselves a progressive nation and pointing to our common sense methods, while we laugh at the antiquated policies of governments like that of Spain, which places every possible obstacle in the way of trade and industry, hampering them by the most absurd restrictions that benefit nobody, and harm incalculably the interests of the public in countless directions. Yet here we adopt in this respect a policy which even Spain could not surpass in the way of fiscal folly. It makes impossible a whole line of most important industries which are now barred out as effectually as if they were specifically prohibited by law. We have adopted tariff measures especially for the building up of new industries. A few years ago there was absolutely no tin-plate manufactured in this country. Heavy moneyed interests declared their readiness to embark in the industry and establish extensive works provided a duty was imposed upon imported plate. This was done and a large share of the tin-plate industry was transferred to the United States.

Now, simply by removing the internal revenue tax from alcohol used in the arts, many industries of unspeakable value would at once spring up in this country, new industries would be created, and an enormous impetus would be given to automobile development. As it is, alcohol is now employed in the arts to so limited an extent in this country that there would be no appreciable loss of revenue from its exemption from taxation. But with such exemption the manufacture of alcohol for such purposes would enormously increase. Under improved processes alcohol can now be manufactured in this country at a cost, it is said, of from eight to ten cents a gallon. Without the tax it should therefore be sold at retail, at a good profit, for fifteen cents a gallon. And there is practically no limit to the possibilities of its production. It is chiefly made from grain with us, but in Germany it is extensively made from potatoes. It

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can be produced from the fermentation of any vegetable substance containing saccharine material: pumpkins, watermelons, fruits of all kinds, roots, stalks and even leaves. Certain crops could easily be grown especially for the production of alcohol used in the arts, and a great benefit to agriculture would ensue. The present development of the use of alcohol in Germany for automobile purposes is directly encouraged by organizations devoted to the promotion of agricultural interests. It would certainly be immensely for the benefit of our own vast agricultural interests to have the use of alcohol so extended, as it thus would be, and American farmers should be alive to the importance of exerting their great power in behalf of the requisite legislation, which would open to them new markets at home. What are now useless fruit and vegetable products could then be profitably utilized for alcohol production.

If alcohol employed in the arts were thus made available a large proportion of automobilists would prefer to use it, even were it twice as expensive as gasoline or other forms of petroleum. Its freedom from unpleasant odor and its superiority in respect to cleanliness would compensate for higher cost. But in reality, were alcohol when so used exempt from taxation it would be fully as cheap as, if not cheaper, than gasoline now is.

In this connection it may be mentioned that increased interest in the use of alcohol in automobile practice is shown in France. Prince Pierre d'Arenberg has lately given the Automobile Club of France a thousand francs for conducting experiments with the use of alcohol, and the automobile daily, *Le Vélo*, announces a second annual run for automobiles with alcohol motive-power over a course from Paris to Chantilly and return, to take place on October 11. The first run of the kind, under the auspices of that journal, took place last year over the same route, but owing to unfavorable weather only one vehicle made its appearance. The results, however, made an interesting contribution to the knowledge of the subject.

THE PROBLEM OF DUST-LAYING

The dust nuisance on steam railways has been so effectively abated by sprinkling the track with crude petroleum that the idea of employing the same means on the highways has naturally occurred. The Boston Park Commission tried an interesting experiment in this direction last season. A section of Jamaica-way, a division of the great Boston and Brookline Parkway, was sprinkled with the oil, about six gallons a linear foot being used.

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The section treated was about 800 feet long. In his report on the experiment the Superintendent of Parks says:

"At the time of its application the roadway was hard, clean and smooth; the first effect seemed to be a slight disintegration of the surface, small pieces of macadam being loosened from their bond, which the wear of traffic crushed into powder; this became permeated with the oil, and formed a cushion on the surface of the road, very elastic and pleasant to drive upon. The treatment resulted in the abatement of dust for a period of two months on that part of the road subjected to it. At the rate paid for the oil the cost was two cents per linear foot, or \$105.60 per mile of road forty feet wide, per barrel lots. It is possible the cost could be much reduced were purchases made by car-load lots. The cost of watering per mile for the same period would be about \$200 per mile. This comparison, however, does not cover the ground, as under the oil treatment the dust was laid perfectly for a period of over two months, night and day, while under ordinary sprinkling with water, even under the most careful management, there are times when the dust cannot be controlled. One serious objection to the adoption of the oil treatment for laying dust on our parkways is the rank odor of the material; after the lapse of six or eight weeks it was still very offensive and the source of much complaint. Apart from that objection the experiment demonstrated the fact that dust can be more effectually laid by the oil treatment than by water sprinkling, and at less than half the cost. To prevent disintegration of the surface, on first application to a hard, clean road, it might be well to spread a cushion of slightly loamy sand as a matrix for the oil."

In spite of the enormous economy over ordinary sprinkling, it will be seen from the foregoing that the rank odor of the oil is something that will make its employment prohibitive. It would be bad enough on an ordinary highway, but on a park road, which is used purely for pleasure, all the pleasure derived from driving through attractive scenery in fresh air would be destroyed by the vile smell ever assailing the nostrils. There is another strong objection, not mentioned in the report, which would make its use impracticable on highways. That is, the destructive action of petroleum on rubber. Anything, of course, would be out of the question that would forbid the use of rubber tires. The railways have recognized this objection, and in sprinkling their roadbeds have refrained from oiling the highway crossings.

A saving of about 50 per cent. over the cost of sprinkling by water is something worth while striving for. And although these objections make the use of oil out of the question, experi-

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ments should be conducted in other directions. Some hygroscopic chemical is said to have been successfully employed in California, where the roads become intolerably dusty in the long summer. Probably a strong brine would be one of the cheapest and most effective things for the purpose. Sea water has been used to advantage in Boston. One objection to its use has proceeded from the whitish deposit on the pavement from the evaporation of the salt water. On a macadamized surface, however, this would be hardly noticeable, and possibly some cheap coloring matter might be used to offset it in the case of stone pavements. In seaboard places where salt water is available the proportion of salt could be increased by the addition of a proportion of strong brine to each cart-load. The greater the proportion of salt in the water the better would be the result. The salt left by evaporation would absorb the moisture from the atmosphere, and so long as this was done, farther sprinkling would be unnecessary. Salt water is vastly cheaper than crude petroleum, and the stronger the solution the less frequently it would have to be employed. Possibly a few sprinklings in the course of a season would answer. This would greatly reduce the cost occasioned by the continual sprinkling necessary in the case of fresh water, which in the driest weather has to be done two or three times a day.

Our present methods of road-sprinkling are crude and unsatisfactory. The work is so unskillfully done as a rule that the surface is deluged with water and more injured than benefited by the process, while the ensuing mud is about as much of a nuisance as the dust would be. But with the hygroscopic action of an evaporated chemical, like salt, just enough atmospheric moisture would be attracted to keep the dust from blowing and maintain the surface in good repair.

AUTOMOBILE WATERING-CARTS

We have previously spoken of some of the advantages that would come from the use of automobile watering-carts. The work would be much better and more quickly done, and there would be no horses to be kept idle in the stable, eating their heads off, at the times when sprinkling was not needed. A great economy would result. The present carts could very quickly be adapted to the new form of traction by using the "fore-carriage" for the purpose. These could be speedily constructed and supplied. There will be a great market for fore-carriages as soon as their construction is undertaken in this country.

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SAFETY STEERING

Automobilists in general will feel immensely greater security, and will take greater pleasure in their driving, when the use of some form of safety steering device becomes universal; something in the way of a lock-steering arrangement, keeping the direction given to the tiller firmly fixed until it is changed. The fatigue, the nervous strain, caused by the constant tension due to a firm grasp of the tiller, is something excessive. It is comparable to that occasioned by the tight hold that must be kept upon the reins in driving a spirited horse. Unless this grasp is maintained unremittingly there is great danger. The sudden striking of a loose stone in the road may throw the tiller out of the hand, with a quick slew and instant disaster as the result. Possibly there are several devices for lock-steering already invented. There is certainly one very effective one, at least, which has stood the test of several years in practical operation, and the writer has had the pleasure of witnessing its remarkable performance. No clutch, or even firm grasp, on the tiller is required—simply a gentle touch now and then; and no sort of jolt or shock, however sudden or violent, can change the direction of the wheels or the tiller until the impulse is given by the driver's volition. The consequence is a remarkable sense of security in operation. It should be worth the while of every automobile manufacturer to obtain the right to use a device of the kind.

HEAVY TRAFFIC MOTOR-POWER

Recent experiments in France as to the form of motive-power best adapted to heavy traffic give the advantage very decidedly to steam, which proves to be the more flexible, adapting itself readily to changed conditions of load, and especially to roads with frequent and sudden differences in grade. On the other hand, the much lighter motors of the explosion type, as for gasoline, had an advantage on level roads. With heavy wagons the cost per ton-kilometre on ordinary roads with a steam motor was 0.373 francs, 0.2 francs, and 0.14 francs, according to whether the vehicle was one-third, two-thirds or completely loaded. With benzine motors the cost under similar circumstances was 0.673 francs, 0.369 francs, and 0.268 francs.

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Garnier Frères have just published "*La France en Poche*," by Le Léadier. The information given in the book is well classified. The unpaved and paved roads of each department of France are enumerated; and other useful facts regarding the nature of the country are given. The volume will probably meet with considerable favor with French touring *chauffeurs*.

The "*Almanach des Sports*," edited by Maurice Leudet, is a magnificently illustrated and well compiled work. The best French authors in the field of sporting literature have contributed some very interesting and readable articles on the bicycle, automobilism, fencing, boxing, wrestling, shooting, football, running, etc.

Manuel théorique et pratique de l'Automobile sur route. Par Gérard Lavergne. Paris, 1900. Ch. Béranger. Octavo. Pp. 700. Illustrated with 329 engravings. Cloth, \$4.00.

After a short history of automobilism and a brief review of the three principal motive agents (steam, petroleum, and electricity) used in most automobiles, M. Lavergne discusses the various elements which make up a motor-carriage—the motor (together with tables giving the power required to drive vehicles of given size and the means of measuring that power), transmission-gears, axles, wheels, tires, springs, frame, carriage-body, brakes, lubrication.

In the third part of the book the elements entering into the construction of a few well-known automobiles are described. Since it would be manifestly impossible to take up every motor-carriage made, the author has confined himself to a few well-recognized types.

The fourth and last part of the volume is devoted to an analysis of the results of the various races and contests which have been held in France. The discussion of these results will probably be of great interest to French manufacturers; for some very wholesome advice is given, to which the maker of automobiles may well devote his attention.

To the man who is about to begin the making of automobiles, this book will probably be of some service. The engineer will learn from it how to apply the mechanical principles, which form his stock in trade, to the automobile and how to solve the difficult technical problems which in the very nature of things he must encounter when he enters the field of automobilism. And lastly, the *chauffeur*, who knows little of machinery, will find in it a

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means of acquiring the technical knowledge he should possess; for the author, in the opening chapters of his work, has so clearly defined and explained the various terms comprising the terminology of automobilism, that no difficulty should be met with in reading the more technical chapters.

As its title, *La Locomotion à travers les âges*, would indicate, Octave Uzanne's new book just issued by Ollendorf, is a historical review of all the means of locomotion employed by man, from prehistoric times to our own day. The text is very handsomely illustrated with engravings by Courboin, representing the vehicles used by the ancients. Several excellently colored plates picture the evolution of locomotion. As one might expect, the last part of the work is devoted to the automobile. The illustrations for this final portion represent most of the types of automobiles. Courboin's idea of a touring motor-carriage is worthy of mention.

"The Haulage of Goods on Common Roads," by H. Wilcke, is a small hand book written in a popular style. The author discusses the important question of road transport. He succeeds fairly well in stating the advantages of the automobile for country traffic. For dealing with large loads Mr. Wilcke propounds a scheme of his own which we notice he has patented. According to this scheme, the vehicles on which the goods are carried are made up into trains, or coupled together, say three or more, each vehicle is provided with a steam motor operating upon the road wheels in a convenient way; all the several motors are supplied with steam from a single boiler, in front of the train, and connected to it. This boiler is mounted on wheels and has its own engine, similar to a traction-engine; in fact it may be a traction-engine. But in this case, in addition to propelling itself, the boiler supplies steam to the engine of each car or vehicle, and also assists in hauling the vehicles.

A book which, although written in French, should prove of inestimable value to American automobilists and manufacturers is the *Annuaire Général de l'Automobile et des Industries qui s'y rattachent* (Annual of Automobilism and allied Industries), compiled by Messieurs Thévin and Houry.

The 1900 annual, which has just come to hand, is an octavo volume of 1,200 pages, which is sold for three dollars.

The book is divided into four divisions. In the first of these is to be found classified by countries (the United States being included) a list of automobile manufacturers, who are in turn classified by the type of vehicles which they make, and of the motors which they employ. The second division is composed of a list of manufacturers of automobile parts and accessories. The

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third division contains a list (by towns) of manufacturers, repair-shops, experts, specialists, petroleum-supply stations, electric charging stations, etc. In the fourth division is a catalogue of automobile clubs, syndicates, and associations, with lists of their members. Transportation by automobiles is also discussed in the division, as well as the automobile tariffs of various countries. There is also a bibliography of automobile literature, patents, and the like. We are pleased to note that the advance made by American manufacturers in the new industry has been properly recognized. It is the intention of the publishers, we have been informed, to incorporate the addresses of all American manufacturers.

From D. Van Nostrand and Company, we have received a copy of "Petroleum Motor-Cars," by Louis Lockert. The book is a translation of the third part of Lockert's "Treatise on Automobiles on the Road," which we have reviewed in these columns. The "Treatise" was one of the first books on the automobile published in France; and none of its four interesting volumes was read with more avidity than that on petroleum automobiles. Since the publication of the work, so many improvements have been made in motor-carriage construction, that Lockert's book must necessarily give place to later discussions of the automobile. Although not fully up to date, "Petroleum Motor-Cars" will no doubt grace the shelves of many a *chauffeur*.

Baudry de Saunier, from whose pen articles have appeared in the AUTOMOBILE MAGAZINE, has just published the second volume of his "*L'Automobile théorique et pratique*." In many respects the book is one of the most remarkable that has ever been written on motor-carriages—remarkable for the originality of the writer's style and for its thoroughly exhaustive discussion of the problems that confront the *chauffeur*. Bits of playful sarcasm alternate with recondite expositions of mechanical theories; amusing descriptions of the difficulties of automobilists give place to discussions of horse-powers and driving-gears. Taken as a whole, the book is one of the most interesting and at the same time one of the most instructive that has been added to the rapidly increasing bibliography of French automobile literature.

Georges Pierron has just completed his "Annuaire du Tourisme" for the Automobile Club de France. The book is a compact little volume, in which every French *commune* finds a place. The hotels are all mentioned, together with information regarding the hospitality accorded in each. The touring members of the Automobile Club de France should find Pierron's book of very considerable value.

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LEE'S AMERICAN AUTOMOBILE ANNUAL FOR 1900 has just been issued from the press of Laird & Lee, of Chicago, and gives another proof of the up-to-date methods of this enterprising firm, since it is the very first original work of the kind published in this country on a subject that is attracting more and more attention the world over. The books on horseless vehicles issued on the other side of the ocean, although valuable in their way, do not really meet the wants of the American reader. The motors and vehicles constructed in the United States have to be built on principles that do not obtain, to an equal degree, in countries where the roads, climates, etc., are radically different. On that account, it is a positive treat to peruse a work written by Americans for Americans. It is clear, simple and complete, avoiding any excess of technicalities, and still describing with full accuracy the leading types of automobiles now on the market. The publishers have been very careful not to allow any particular firms of builders to be recommended at the expense of the others. Every system: gasoline, steam, electricity, is exhaustively discussed and illustrated, the author's opinion being given fearlessly as to the relative value of each. Over 100 cuts render the explanations easy to follow and understand. The rules and regulations adopted by leading cities in the country for the safe handling of automobiles on the public highways are given in full, together with monthly calendars, an automobile log-book, etc., etc. The size is handy for the pocket, and the work, as a whole, highly creditable and meritorious. [Flexible leather, \$1.50.]



The Automobile Index

Everything of permanent value published in the technical press of the world devoted to any branch of automobile industry will be found indexed in this department. Whenever it is possible a descriptive summary indicating the character and purpose of the leading articles of current automobile literature will be given, with the titles and dates of the publications.

A British Pioneer of the Automobile—

"The Autocar," Coventry, England, March 7, 1900.

A Carbonic Acid Automobile—

A technical article by G. Chauveau. With two illustrations. "The Automobile Magazine," May, 1900.

Accumulators—

Description of German Accumulators. "Automobile," Berlin, March 26, 1900.

Management of storage batteries, an article. "Motor-Car World," London, Eng., May, 1900.

Acetylene, Its Properties and Possibilities—

By Geo. W. Waltenbough. A technical article. "The Automobile Review," Chicago, Ill., 1900.

A Chainless Gasoline Truck—

A descriptive article. Illustrated. "The Automobile Magazine," May, 1900.

A Combined Automobile and Tramway Omnibus—

A description. With two illustrations. "The Scientific American," New York, April 21, 1900.

Alcohol Automobile—

Described and illustrated. "Le Chauffeur," Paris, April 11, 1900.

Alcohol in Automobile Practice—

A review of important facts in relation to alcohol as motive power for automobiles. "The Automobile Magazine," May 1, 1900.

Alcohol Motor—

Described and illustrated. "Le Chauffeur," Paris, April 11, 1900.

A Map of the Electric Stations of France—

A prospectus of a plan for the establishment of charging stations, prepared by the Touring Club of France. "The Automobile Magazine," May, 1900.

A New French Carriage—

A technical description of the Ramus voiturette. With two illustrations. "The Motor-Car Journal," London, Eng., March 30, 1900.

Automobile Exposition—

A review of the Berlin automobile exposition, 1899. "Der Motorwagen," Berlin, April 15, 1900.

Automobile Philosophy—

With two illustrations. By John Hope. "The Autocar," Coventry, Eng., April 7, 1900.

Automobiles in Australia—

Article. "Motor-Car Journal," London, Eng., April 13, 1900.

Carbureter—

The Longuemare Petroleum (heavy oil). Described and illustrated. "The Automotor Journal," London, Eng., March, 1900.

Carriage Builders and Automobiles—

By William Philipon. "The Motor-Car Journal," London, Eng., April 6, 1900.

Charging Apparatus for Accumulators—

A technical description. With illustrations. "The Automobile Magazine," May, 1900.

Coils—

Induction Coils, by H. E. Wimperis. An illustrated account of the construction and working. 1st paper. "The Automotor Journal," London, Eng., March, 1900.

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Combination Carriage—

The Pieper Combination Carriage. Illustrated description of a vehicle fitted with both a gasoline motor and a storage battery electric motor. "Horseless Age," New York, March 7, 1900.

Compressed Air—

A Compressed Air Automobile (*Une Automobile à Air Comprimé*). By Daniel Bellet. A description of the Molas, Lamielle and Tessier vehicle, with details of the compressed air motor and differential gearing. "Revue Technique," Paris, France, February 10, 1900.

Diary of Forthcoming European Automobile Events—

Published for the benefit of American tourists. "The Automobile Magazine," May 1900.

Electric Attachment for Steam Automobiles—

A brief description. With two illustrations. "Electrical World and Engineer," New York, April 14, 1900.

Electric Cab—

Working Drawings of an Electric Cab. Illustrating the design of the side elevation and mechanical features. "Scientific American" Supplement, New York, March 10, 1900.

Electric Forecarriage—

System Heilmann described and illustrated. "Le Chauffeur," Paris, April 11, 1900.

Electric Vehicle Equipment—

By W. H. Chapman. An article with two illustrations. "The Automobile Review," Chicago, Ill., April, 1900.

Gallery of American Automobiles—

Illustrating four types of automobiles of American manufacture. "The Automobile Magazine," May, 1900.

Handling of Accumulators—

Advice as to the management of storage batteries. "Automobile," Berlin, March 10, 1900.

Heavy Traffic Automobiles—

Review of the heavy automobile competition at Versailles, 1898. "Der Motorwagen," Berlin, Germany, April 15, 1900.

Hydro-carbon Automobiles—

Description of George Richard's vehicle. Illustrated. "La France Automobile," Paris, France, April 1, 1900.

System de Bonstetten, described and illustrated. "Le Chauffeur," Paris, March 11, 1900.

Ducrosset's mountain automobile. Described and illustrated. "Le Chauffeur," Paris, March 11, 1900.

Hydro-carbon Motor—

The Aster motor described and illustrated. "Le Chauffeur," Paris, March 25, 1900.

Ignition—

A technical description of an electric gas engine igniter, new in design. With one illustration. "The Automobile Review," Chicago, Ill., April, 1900.

Description of a new ignition battery. With one illustration. "The Automobile Review," Chicago, Ill., April, 1900.

Brief description of the Meyra dry battery. With one illustration. "The Motor-Car Journal, London, Eng., April 13, 1900.

Technical description of the Pul-len reversible primary battery. With two illustrations. "The Motor Vehicle Review," Cleveland, O., May 1, 1900.

King's Automobile Hub—

A description of a new device. With five illustrations. "The Motor Age," Chicago, Ill., April 19, 1900.

Laterally Loaded Struts in Automobile Construction—

An article. "The Automotor Journal," London, Eng., April, 1900.

Lubricators for Automobiles—

Description of an oil-feeding device, made from aluminum. With three illustrations. "Motor-Car Journal," London, Eng., April 13, 1900.

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